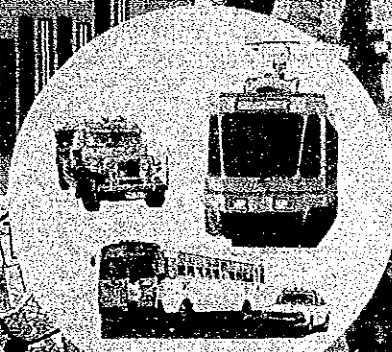
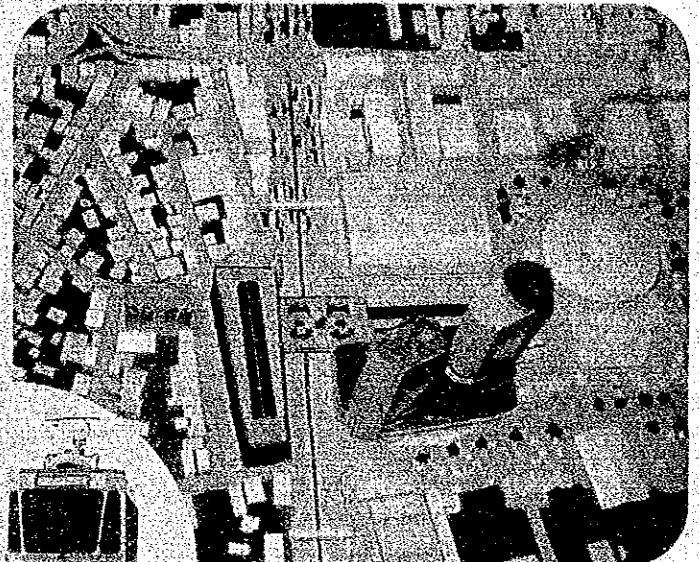
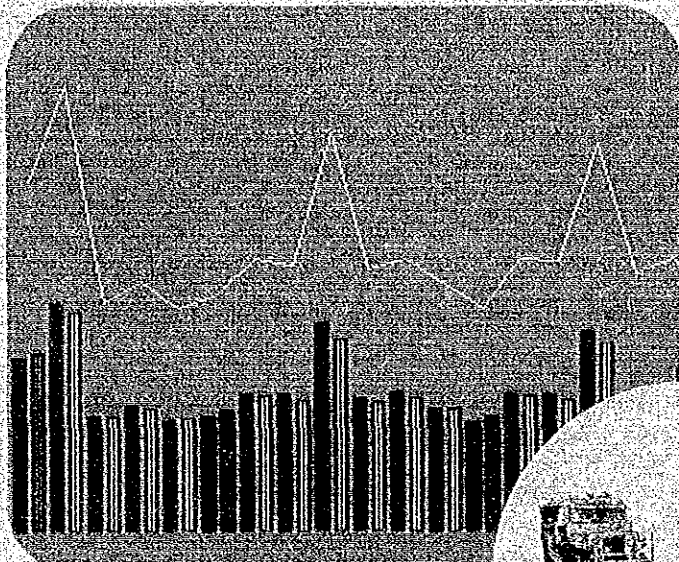


The Metro Manila Transportation Planning Study Phase II Final Report

TECHNICAL REPORT

User's Reference on Microcomputer Seminar for Transportation Planning



SEPTEMBER 1985

JAPAN INTERNATIONAL COOPERATION AGENCY

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Transportation Planning Study
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TABLE OF CONTENTS

| | Page No. |
|---|----------|
| 1.0 INTRODUCTION AND OBJECTIVES | |
| 2.0 OVERVIEW OF MICROCOMPUTERS IN TRANSPORTATION | |
| 2.1 The Past | 3 |
| 2.2 The Present | 3 |
| 2.2.1 Specific Areas of Applications in Transportation | 3 |
| 2.2.2 Commercial Packages | 6 |
| 3.0 JUMSUT'S CONTRIBUTION | |
| 3.1 Introduction | 8 |
| 3.2 JUMSUT's Application Packages | 9 |
| 3.3 JUMSUT's Seminar on the Role of Microcomputer in Public Transportation Planning | 9 |
| 3.3.1 Background | 9 |
| 3.3.2 Structure and Content | 10 |
| 3.3.3 Methodology | 10 |
| 3.3.4 Resource Persons and Participants | 12 |
| 4.0 USER'S REFERENCE MANUAL ON JUMSUT-DEVELOPED MICROCOMPUTER PROGRAMS FOR TRANSPORTATION PLANNING | |
| 4.1 Objective of the Manual | 13 |
| 4.2 Program and Data Files Structure | 13 |
| 4.3 Program Functions and Operations | 13 |
| 4.3.1 SECODABAS | 15 |
| 4.3.2 JERIMAS | 41 |
| 4.3.3 NEAP | 62 |

APPENDICES

LIST OF TABLES

| | Page No. |
|--|----------|
| 2.1 General Hardware Environment for the Programs Surveyed | 5 |
| 2.2 Commercial Packages Available for the Microcomputer | 7 |

LIST OF FIGURES

| | Page No. |
|--|----------|
| 1.1 Comparison Between the Microcomputer and Other Computers | 1 |
| 2.1 Application Areas in Transportation Planning | 4 |
| 3.1 Structure of the JUMSUT II Micro-Training | 11 |
| 4. 1 Structure of JUMSUT-Developed Programs and Data Files | 14 |
| 4. 2 Zone Conversion Table and Map (202 zones to 24 zones) | 18 |
| 4. 3 Zone Conversion Table and Map (202 zones to 58 zones) | 19 |
| 4. 4 Flowchart of TRNDAT.NAK | 20 |
| 4. 5 Flowchart of AGGZN.NAK | 24 |
| 4. 6 Flowchart of PRIDAT.NAK | 27 |
| 4. 7 Flowchart of HGRAPH.NAK | 30 |
| 4. 8 Flowchart of PAINMP.NAK | 33 |
| 4. 9 Flowchart of ODLIN.NAK | 38 |
| 4.10 Flowchart of JERIMAS | 44 |
| 4.11 Basic Structure of Traffic Assignment Program for the Microcomputer | 62 |
| 4.12 Speed-Flow Relationship (Delay Function) | 64 |
| 4.13 Flowchart of the Network Assignment Program | 65 |

LIST OF APPENDICES

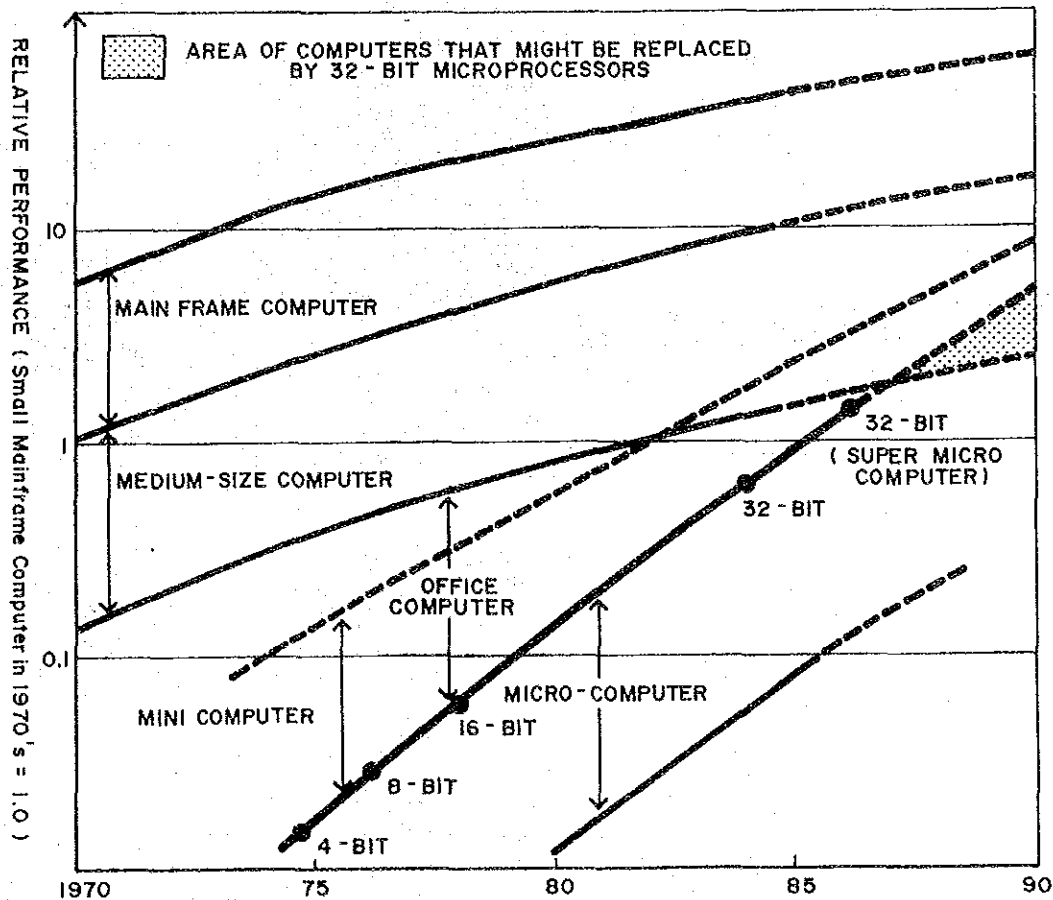
| | Page No. |
|-----|--|
| 2.1 | Summary of Surveyed Microcomputer Programs 68 |
| 2.2 | Program for the Microcomputer Seminar held in Australia (February 1984) 71 |
| 2.3 | Program for the Microcomputer Seminar held in Singapore (July 1985) 72 |
| 3.1 | JUMSUT Data Base 73 |
| 3.2 | Seminar 10 - Understanding Microcomputers 74 |
| 3.3 | Seminar 20 - Spreadsheet Application 75 |
| 3.4 | Seminar 30 - An Introduction to Basic Programming on a Micro 76 |
| 3.5 | Seminar 40 - Project Management 77 |
| 4.1 | Exercises on SECODABAS 78 |
| 4.2 | Character Formats of JERIMAS Data Items 79 |
| 4.3 | Area Code List (RTINFO and FREQSC). 81 |
| 4.4 | Exercises on JERIMAS 82 |

1.0 INTRODUCTION AND OBJECTIVES

Computers have become an interesting and indispensable tool in man's quest for a faster and more accurate manner of accomplishing a task. From mainframes to minicomputers and to the ever-increasing popularity of microcomputers, almost all aspects of endeavors, be it in the government or private sector, the role of computers has been given more importance.

In the field of microcomputers, technological innovations seem to be moving so fast, that by the time planners are able to finally determine ways and means to use them effectively, more new products have been developed! While application softwares are being designed, the continuing advancements in microcomputers are so far-reaching that one need not to worry about the computational constraints of the hardware.

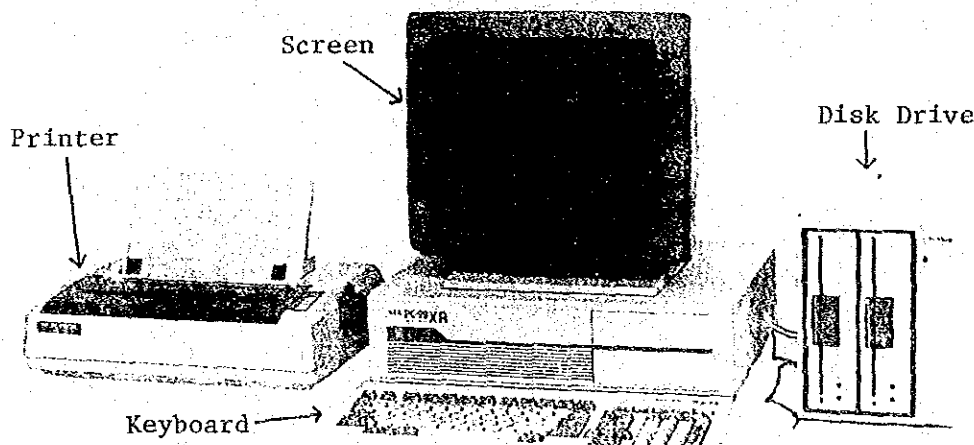
Figure 1.1
Comparison Between the Microprocessor
and other Computers



Source : NIKKEI BUSINESS (JUNE 24, 1985)

One specific area where the utilization of the microcomputer can be of great benefit is in the field of transportation. In recognition of the important role of microcomputers in transportation, therefore, this report was prepared, keeping in sight a three-fold objective:

- a) to provide an overview of microcomputer softwares, applications and their development in transportation;
- b) to describe what the Metro Manila Transportation Planning Study (JUMSUT), Phases I and II have done in order to integrate existing and developed data base in a more orderly and useful source for transportation planning studies; and
- c) to provide the end-users (specifically MOTC and its related agencies) with a "User's Manual" on the three systems for transportation planning designed by JUMSUT.



An NEC Personal Computer (PC-98XA)

2.0 OVERVIEW OF MICROCOMPUTERS IN TRANSPORTATION

2.1 THE PAST

In previous years, the process/review of transportation-related data, i.e., inventories, record systems, traffic characteristics, etc., involved a lot of work by manual methods, and therefore more hassles. Coupled with these were the time and amount of money spent for the completion of work. Sometimes, data, which were already processed, would simply be disregarded because of a change in a basic factor. The whole process of counting/tallying, and calculating, then, had to be repeated.

The advent of computer mainframes, followed by the minicomputers, lessened the work burden. However, costs incurred were deemed too high. Then 1971 saw the emergence of the first microprocessor by Intel and paved the way for others to follow. The machines were generally operated with 4 to 16K (K=1,024 bytes) of random access memory (RAM); disk drivers were seldom used.

2.2 THE PRESENT

Although the enormous capacity of computer mainframes in terms of massive shared data bases, multi-user environment, computational speed and memory capacity cannot be denied, the fact that it can also prove to be inconvenient and definitely more expensive can no longer be overlooked.

Microcomputers, on the other hand, have a lot of advantages going in its favor:

- inexpensive
- user-friendly
- ample capacity
- speed

2.2.1 Specific Areas of Applications in Transportation

The microcomputer has been used in the following areas of transportation:

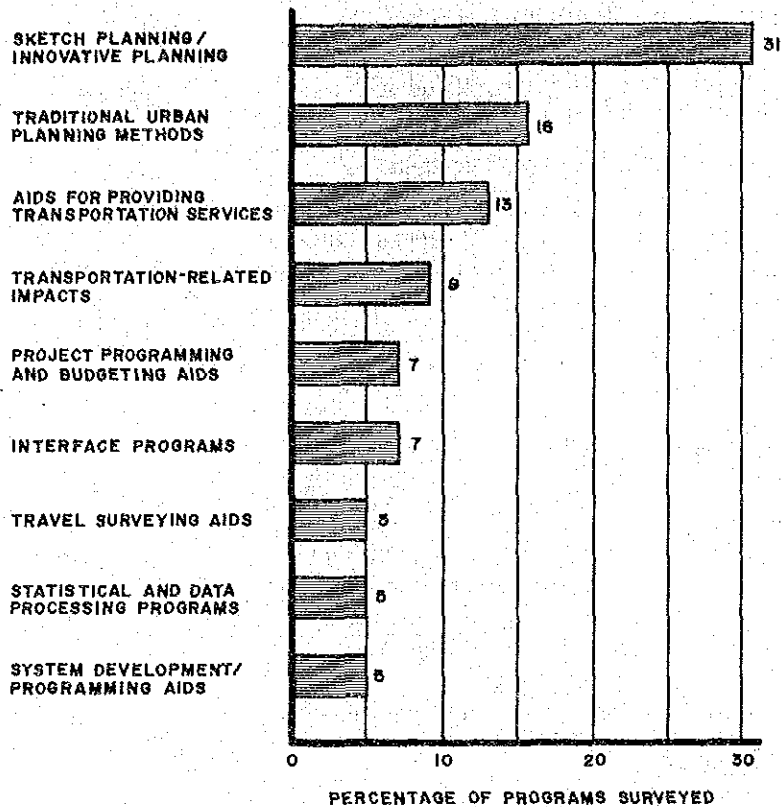
- Planning
- Transit Operations
- Traffic Engineering
- Railroad Engineering
- Civil Engineering

A. Transportation Planning

Hardware and software information on microcomputers in transportation planning may be gleaned from the results of a telephone survey conducted, combined with several published reports.

From the survey results, a total of fifty-five (55) programs were identified, which were categorized according to their areas of application (see Figure 2.1 and Appendix 2.1).

Figure 2.1
Application Areas in Transportation Planning



Source: Microcomputer Software for Transportation Planning, Earl R. Rulter and Mark Waller, Transportation Research Board 932, 1983.

Programs on sketch planning/innovative methods, which deals with quick response, analysis methods to predict some aspect of urban transportation patterns, topped the list (31%); a far second are programs on traditional urban planning method (16%).

With regard to programming languages used, BASIC seems to be the most common, although Pascal and Fortran are not far behind.

The hardware environment under which the programs surveyed are generally run is shown in Table 2.1.

Table 2.1
General Hardware Environment
for the Programs Surveyed

| A. Operating System | | B. Memory Requirement | | C. Disk Requirement | |
|---------------------|--------------------------|--|-----------------------|---------------------|-----------------------|
| Type | Operating System (%) | Memory Size or Capacity (K ^{3/}) | Programs Surveyed (%) | Type | Programs Surveyed (%) |
| Single | 49 | 14 | 2 | Floppy | 80 |
| Multiple | 28 (UCSD ^{1/}) | 16 | 5 | Hard | 18 |
| | 17 (CP/M ^{2/}) | 32 | 5 | No Disk | 2 |
| | 6 (UNIX) | 48 | 16 | | |
| | | 64 | 62 | | |
| | | 512 | 5 | | |
| | | 1,024 | 5 | | |

Source: Microcomputers in Transportation Planning, Earl R. Ruiter and Mark Waller, Transportation Research Board 932, 1983

1/ University of California, San Diego

2/ Control Program for Microcomputers

3/ K = 1,024 bytes

B. Transit Operations

Some microcomputer applications in transit agencies are as follows:

- 1) Financial planning, especially budgeting and cash forecasting
- 2) Business applications, such as payroll and parts inventory
- 3) Ride-check data analyses
- 4) Vehicle requirement forecasting

C. Traffic Engineering

Generally, applications for traffic engineering require a data base system:

- 1) Inventory System
- 2) Accident Record System
- 3) Integrated Traffic Data Base System

It is worth mentioning that microcomputers play an important role as an intelligent terminal to traffic signal systems. Other areas of microcomputer applications are turning movement counts and travel time studies.

D. Civil Engineering

Some examples of applications for the microcomputer in civil engineering are as follows:

- 1) Roadway and Site layout (COGO systems)
 - vertical curve design
 - surveys
 - field note reduction
- 2) Highway design process (EARTHWK, SLOPE)
 - slope stability
 - cut and fill calculations
- 3) Structural design (Programs from DISCO-TECH, CIVILSOFT, HP, DEC)
 - simple beam design and member selection
 - beam, plane frame, and grillage analysis
- 4) Hydraulics analysis and design systems (Programs from DISCO-TECH AND CIVILSOFT)
 - storm water detention
 - pipe network analysis
 - open channel hydraulics
 - backwater analysis
- 5) Pavement design (COMPAVE, other programs from CIVILSOFT)
 - concrete and bituminous-mix design
 - evaluation of existing pavement conditions

2.2.2 Commercial Packages

In addition to tailor-made packages prepared for specific areas of transportation, there are general utility packages for the microcomputer which are more readily accessible at less cost, that can prove to be of great use in the field of transportation. The most popular are listed below and briefly described in Table 2.2, with corresponding examples of available softwares.

- a) Word Processors
- b) Electronic Spreadsheets
- c) Database Managers

Aside from those mentioned above, two other utility programs for the microcomputers are readily available - Graphics and Communications.

Graphics provides the users with a visual demonstration of findings/results, by means of bar charts, line graphs, and pie charts. General utility graphics packages can be integrated with electronic spreadsheet programs to assist in the display of results.

Communications packages turn microcomputers into intelligent terminals, allowing for time-sharing and transmittal/retrieval of entire files of data from a mainframe system.

Table 2.2
Commercial Packages Available for the Microcomputer

| Commercial Package | Purpose | Features | Examples |
|---------------------------|--|---|--|
| 1) Word Processor | To enter and edit textual materials, store, and print | Editor, File Manager, Formatter | Wordstar, Super- scribe, Super- Text, Multimate, Magic Wand, Spellbinder |
| 2) Electronic Spreadsheet | To enter and manipulate figures with complete flexibility and perform desired computations | Editor, File Manager, Formatter Graphics | SuperCalc, Visi- Calc, LogiCalc, Multiplan, Lotus 123 |
| 3) Database Managers | To create and maintain multiple, related data files and coherently extract information | File Manager plus Multiple Files/Related Items, Nonredundancy of data, Data Security and Integrity, Query Processing, Host Language Interface | MDBS III, DBASE II, CONDOR, FMS- 80 Selector V |

Microcomputers are here to stay. However, for the microcomputers to further expand and develop, several considerations have to be taken.

- a) The provision of portability, both in software and hardware features of the microcomputer, should be specified. A standard operating system and language would help minimize redundancy of software development.
- b) Encourage the dissemination of information through newsletters, seminars and workshops. This would be an effective medium for the exchange of new developments.

Initial efforts in this regard are being made by different institutions/organizations, notably, the Transportation Research Board of the United States and the Australian Road Research Board (ARRB). In addition, various microcomputer seminars are being conducted worldwide. Examples are shown in Appendices 2.2 and 2.3.

3.0 JUMSUT'S CONTRIBUTION

3.1 INTRODUCTION

The Metro Manila Transportation Planning Study (JUMSUT) Phase I (October 1982 - November 1983) was conceived with the objective of strengthening the transportation data base and planning procedures required for the different phases of transportation planning. Upon its completion, JUMSUT I was able to compile a data base which principally covers data relative to socio-economic characteristics, road facilities/traffic, public transportation, Home Interview Survey (HIS) data and data files for TRANSTEP* usage. These have been compiled in the form of magnetic tapes, diskettes, documents, maps and original survey sheets (see Appendix 3.1).

In addition, a mini data base stored on diskettes for the microcomputer for MOTC's internal use has been developed; namely:

- a) 1980 socio-economic data on a 202-zone system encompassing Metro Manila;
- b) Road and traffic data for major corridors;
- c) Simplified public transportation data for jeepneys;
- d) OD tables (24 zones)

With these data, combined with existing primary data (basic data which are important sources for processing secondary data), JUMSUT I was able to develop programs/packages which could effectively and conveniently meet MOTC's immediate planning requirements.

* TRANSTEP is a suite of programs designed by R. J. Nairn and Partners Pty, Ltd. of Australia to tackle land-use and/or transportation problems. The package consists of 12 functional modules, each module being a stand-alone program. They can be run in isolation, or as a sequence of separate runs. Seven (7) modules perform only utility functions, whereas the remaining 5 perform simulative or forecasting modelling functions, as follows: a) Activity Patterns Model, b) Modal Split, c) Assign Trips, d) Land Use Analysis and Projection, and e) Load Public Transport. For more information about TRANSTEP, please refer to the JUMSUT I Final Report (March 1984): Main Text Part IV, Chapter 15 entitled "Transportation Data Base and Planning Procedures". The later version of TRANSTEP is currently available on IBM PC XT and CROMEMCO System One computers and incorporates several updated features including Fortran 77.

3.2 JUMSUT's APPLICATION PACKAGES

The application packages of JUMSUT I were designed primarily to efficiently monitor relevant data for MOTC's planning programs. These are as follows:

A. Socio-economic Database Management System (SECODABAS)

This system facilitates the usage of the JUMSUT 1980 socio-economic data such as population, household, and income.

B. Jeepney Route Management Information System (JERIMAS)

This information system was designed in order to effectively manage the growing complexity of jeepney operations in Metro Manila.

C. Highway Traffic Assignment Program (NEAP)

This system evaluates road traffic under different conditions. It assumes the predetermined traffic volume of public transport vehicles by link and assigns private traffic into the network, taking public vehicle traffic into account.

3.3 JUMSUT'S SEMINAR ON THE ROLE OF MICROCOMPUTERS IN PUBLIC TRANSPORTATION PLANNING

3.3.1 Background

As the case in almost all foreign-aided projects, technology transfer has always been a major component. In JUMSUT I, this was accomplished through on-the-job training, lectures and manuals. However, at the outset of JUMSUT II, it was decided with MOTC, that technology transfer may be best achieved by conducting a training seminar on the use of microcomputers in public transportation planning, in close coordination with the U.P.- Transport Training Center (TTC). The selection of the subject matter has been justified by the following factors:

- JUMSUT I generated a collection of data about the Metro Manila transportation system and designed 3 packages of microcomputer programs which would be useful to MOTC planners;
- Need to raise the productivity of transport planning staff by relying on the latest available technology;
- The novelty of the subject matter and the corresponding lack of training opportunities.

Because of budgetary and staff-time constraints, only about forty (40) hours of training had been offered from September 1984 to February 1985.

3.3.2 Structure and Content

Informal discussions with prospective trainees had established the need for fundamentals. Thus, four seminar modules of one day each and three tutorial sessions were designed, as illustrated in Figure 3.1. The sequence was from the elementary to the more advanced, from simple to complex topics.

The seminars were primarily intended to provide the participants with a basic understanding of the microcomputer and its role in transportation, as well as a working knowledge of the relevant general-purpose software packages, such as electronic spreadsheets and project management. Tutorial sessions, on the other hand, were geared towards the orientation of the participants on the actual operation of the three ready-to-run JUMSUT I-developed application programs specific to the Metro Manila transportation system.

A brief description of each seminar/tutorial is given as follows:

Seminar 10 - Microcomputer Fundamentals: Designed for the novice to gain a working knowledge of micros and their usefulness to transportation.

Seminar 20 - Spread-sheet Applications: Working proficiency in SuperCalc as a tool of analysis in transportation.

Seminar 30 - Programming Basic: Introduction to computer programming using the most popular language - BASIC.

Seminar 40 - Project Management: Constructing bar charts and X-curves with the aid of micros.

Tutorial 10 - Socio-economic Data Base (SECODABAS): How to run the JUMSUT-developed program to process, access, and manipulate various socio-economic data about Metro Manila's transport. (Particularly useful to MMC Staff).

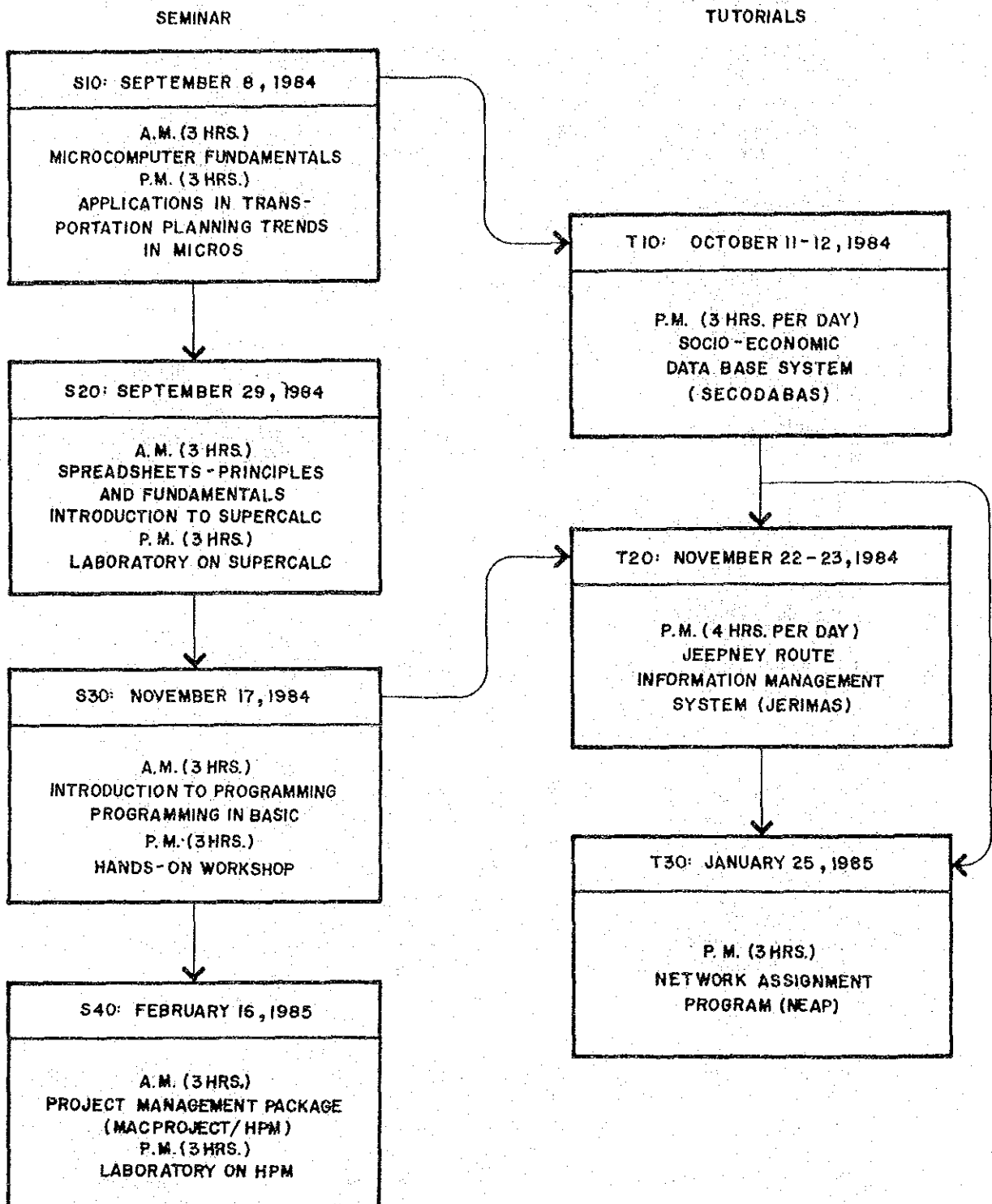
Tutorial 20 - Jeepney Route Information Management System (JERIMAS): Running and using the JUMSUT-developed programs to access and display in graphics the data about the jeepney routes and frequencies (Particularly useful to BOT personnel).

Tutorial 30 - Network Assignment Program (NEAP): Running a traffic assignment model to determine vehicular volumes at designated road links (Particularly useful to MPWH personnel).

3.3.3 Methodology

The trainees were chiefly end-users with little or no computer experience. Therefore, the content and manner of training had been adjusted to meet their needs and level of computer comprehension. The classroom type of instructions was selected and adopted, this being the most accepted method within the constraints of the Project.

Figure 3.1
Structure of the JUMSUT II Microcomputer Training Programme



All seminar modules, except for the last one on project management held at MOTC, were conducted at TTC on Saturdays. They were in the form of lectures, discussions and demonstrations, supplemented by hands-on exercises utilizing ten (10) Fujitsu FM microcomputers of TTC.

Tutorials on the other hand, were scheduled on weekday afternoons at MOTC in the form of demonstrations and hands-on exercises, using two (2) NEC microcomputers. The emphasis was more on intensive skills development, the "how to's" rather than "why's" of a topic.

Carefully selected reading materials and other relevant handouts were distributed at least two (2) days before the scheduled seminar or tutorial. Detailed programs for each seminar are attached as Appendices 3.2 to 3.5.

3.3.4 Resource Persons and Participants

Since the JUMSUT II seminars were sponsored jointly with TTC, the majority of the lecturers and resource persons (aside from JUMSUT II consultants and some outside experts) were TTC personnel themselves. In this way, the Project had been able to support the objective of utilizing TTC's resources and facilities, both physical and human, with corollary payoffs.

The tutorial sessions were closely supervised by the MOTC-MIS counterpart and a consultant of JUMSUT II. Registrations during these tutorials were strictly limited to about ten (10) people to ensure personal supervision of the participants in learning how to operate the systems, and also to compensate for the limited capacity of the room and limited computers available.

The main recipients of the training were the Land Transportation Planning Division (LTPD) staff of MOTC. Other personnel of MOTC-MIS, Bureau of Land Transportation (BLT), Board of Transportation (BOT), Ministry of Public Works and Highways - Traffic Control Center (MPWH-TCC), as well as the Metro Manila Commission (MMC) Office of the Commissioner for Planning (OCP) and Traffic Operations Center (TOC), were also invited to attend. In addition, JUMSUT II local staff participated during the seminars. The total number of registered participants was thirty (30). The group distribution is summarized below.

| Staff/Group | No. |
|-----------------|-----|
| MOTC-LTPD | 11 |
| MOTC-MIS | 2 |
| BLT | 1 |
| BOT | 2 |
| MPWH-TCC | 2 |
| MMC-OCP | 2 |
| MMC-TOC | 4 |
| JUMSUT II Staff | 6 |
| Total | 30 |

4.0 USER'S REFERENCE MANUAL ON JUMSUT-DEVELOPED MICROCOMPUTER PROGRAMS FOR TRANSPORTATION PLANNING

4.1 OBJECTIVE OF THE MANUAL

This manual has been developed in order to provide MOTC and its end-users with a simple, easy-to-use, yet comprehensive guide in learning how to operate the three systems described in Chapter 2. It contains a general description of the three systems (their respective features and data files), step-by-step procedures for program operation, as well as complete illustrations and sample sessions.

4.2 PROGRAM AND DATA FILES STRUCTURE

The JUMSUT-developed programs have been designed basically as a menu-type or manual-free system wherein the user simply follows the instructions which appear on the CRT. Because of the volume of data to be handled, the system requires the use of 3 separate diskettes, each containing the programs and data files relevant to each particular application. A systems diagram of the programs is illustrated in Figure 4.1.

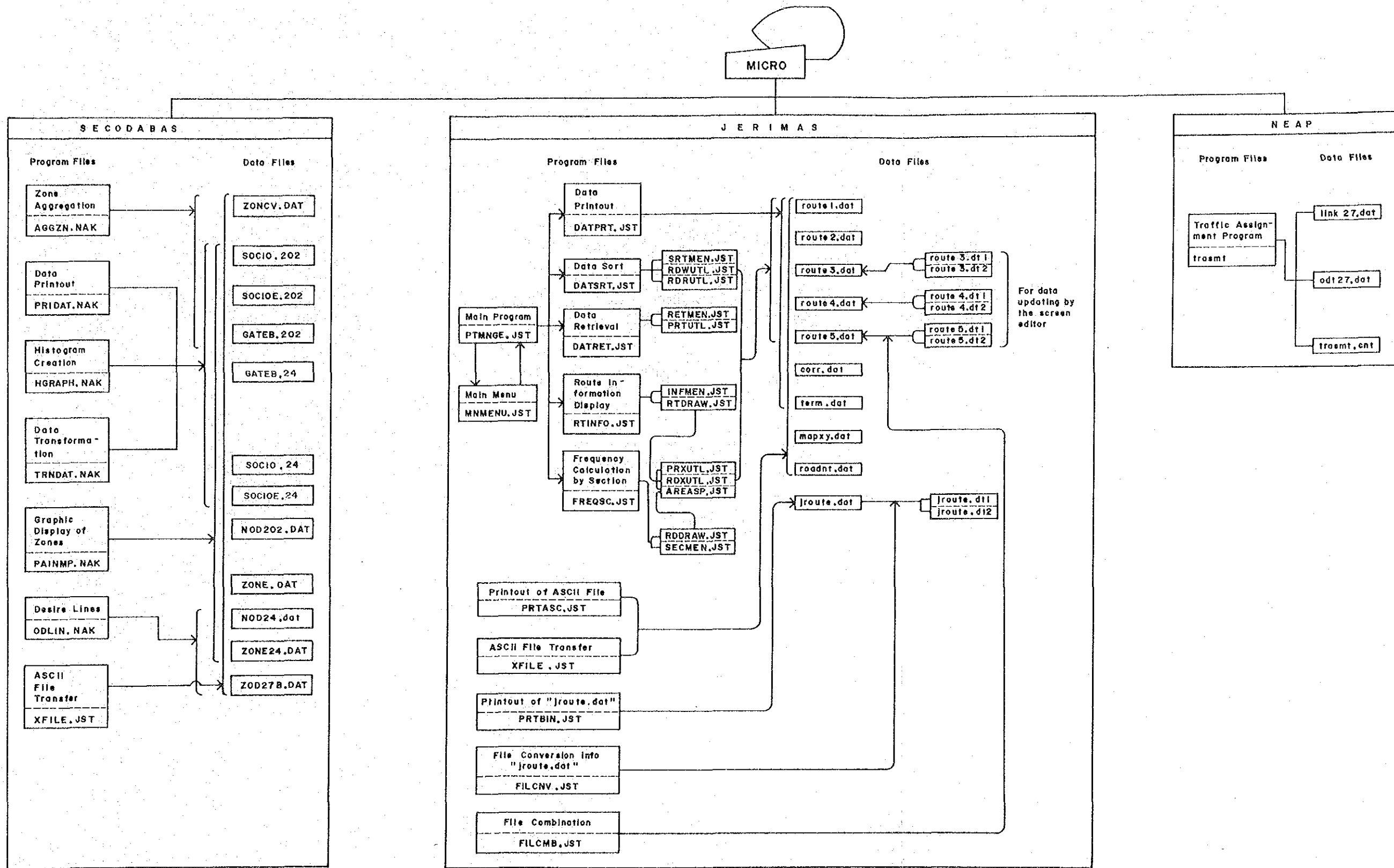
The three systems are:

- a) SECODABAS: consists of 6 independent programs; used to process, access and manipulate the JUMSUT 1980 socio-economic data about Metro Manila's transportation; the data are contained in 12 files.
- b) JERIMAS: consists of a single main program comprising 5 function programs, and 6 small and independent utility programs; designed to facilitate MOTC's control of various information on the existing 744 jeepney routes in Metro Manila, contained in 10 basic data files (5 on routes, 1 on corridors, 1 on terminals, and 3 on the road network and route configuration).
- c) NEAP: is a single program which assumes predetermined traffic volume of public transportation vehicles by link and assigns private traffic onto the network; requires two data files, i.e., OD tables and link data.

4.3 PROGRAM FUNCTIONS AND OPERATIONS

The functions and operations of each program are described in the following subsections. For easier reading and understanding, actual displays are illustrated and arranged sequentially as they appear on the screen. Explanations and other comments shall be found on the right side of the screen boxes. If the user follows all the instructions, the text and charts/figures displayed on the screen should match the examples in this manual.

Figure 4.1
Structure of JUMSUT-developed Programs
and Data Files



4.3.1 SECODABAS

The six program files are:

- a) TRNDAT.NAK : Data transformation
- b) AGGZN.NAK : Zone aggregation
- c) PRIDAT.NAK : Data printout
- d) HGRAPH.NAK : Histogram creation
- e) PAINMP.NAK : Graphic display of zones based on a specific indicator
- f) ODLIN.NAK : Graphic display of desire lines

The twelve files are as follows:

- a) SOCIO.202 : Socio-economic data of 202 traffic zones of Metro Manila

| | |
|--------|------------------------------------|
| 1 S | Area (ha) |
| 2 H | No. of Households |
| 3 PN | Population |
| 4 HI | Household Income (Zone Total P000) |
| 5 HCO | No. of Car Owning Households |
| 6 P7N | Population (>6 Years Old) |
| 7 EN | Employment |
| 8 E1N | Employment (Primary) |
| 9 E2N | Employment (Secondary) |
| 10 E3N | Employment (Tertiary) |
| 11 STN | No. of Students |
| 12 P7D | Daytime Population (>6 Years Old) |
| 13 ED | Daytime Employment |
| 14 E1D | Daytime Employment (Primary) |
| 15 E2D | Daytime Employment (Secondary) |
| 16 E3D | Daytime Employment (Tertiary) |
| 17 STD | No. of Students in Daytime |

- b) SOCIOE.202 : Expanded socio-economic data of 202 traffic zones

| | |
|----------|--|
| 1 S | Area (Ha) |
| 2 H | No. of Households |
| 3 PN | Population |
| 4 HI/H | Average Household Income (P/H) |
| 5 RCO | Car Owning Rate (%) |
| 6 P7N | Population (>6 Years Old) |
| 7 EN | Employment |
| 8 E1N | Employment (Primary) |
| 9 E2N | Employment (Secondary) |
| 10 E3N | Employment (Tertiary) |
| 11 RE1N | Rate of Primary Industry in Employment (%) |
| 12 RE2N | Rate of Secondary Industry in Employment (%) |
| 13 RE3N | Rate of Tertiary Industry in Employment (%) |
| 14 STN | No. of Students |
| 15 P7D | Daytime Population (>6 Years Old) |
| 16 ED | Daytime Employment |
| 17 E1D | Daytime Employment (Primary) |
| 18 E2D | Daytime Employment (Secondary) |
| 19 E3D | Daytime Employment (Tertiary) |
| 20 RE1D | Rate of Primary Industry in Daytime Employment (%) |
| 21 RE2D | Rate of Secondary Industry in Daytime Employment (%) |
| 22 RE3D | Rate of Tertiary Industry in Daytime Employment (%) |
| 23 STD | No. of Students in Daytime |
| 24 P7D/S | Population Density (/ha) |
| 25 P7D/S | Population Density in Daytime (/ha) |

- c) SOCIO.24 : Socio-economic data of 24 traffic zones (Same data items as SOCIO.202)
- d) SOCIOE.24 : Expanded socio-economic data of 24 traffic zones (Same data items as SOCIOE.202)
- e) GATEB.202 : Trip generation and attraction by mode and by purpose, 202 zones. (Mode: public/private, purpose: home/to work/to school/private/business)

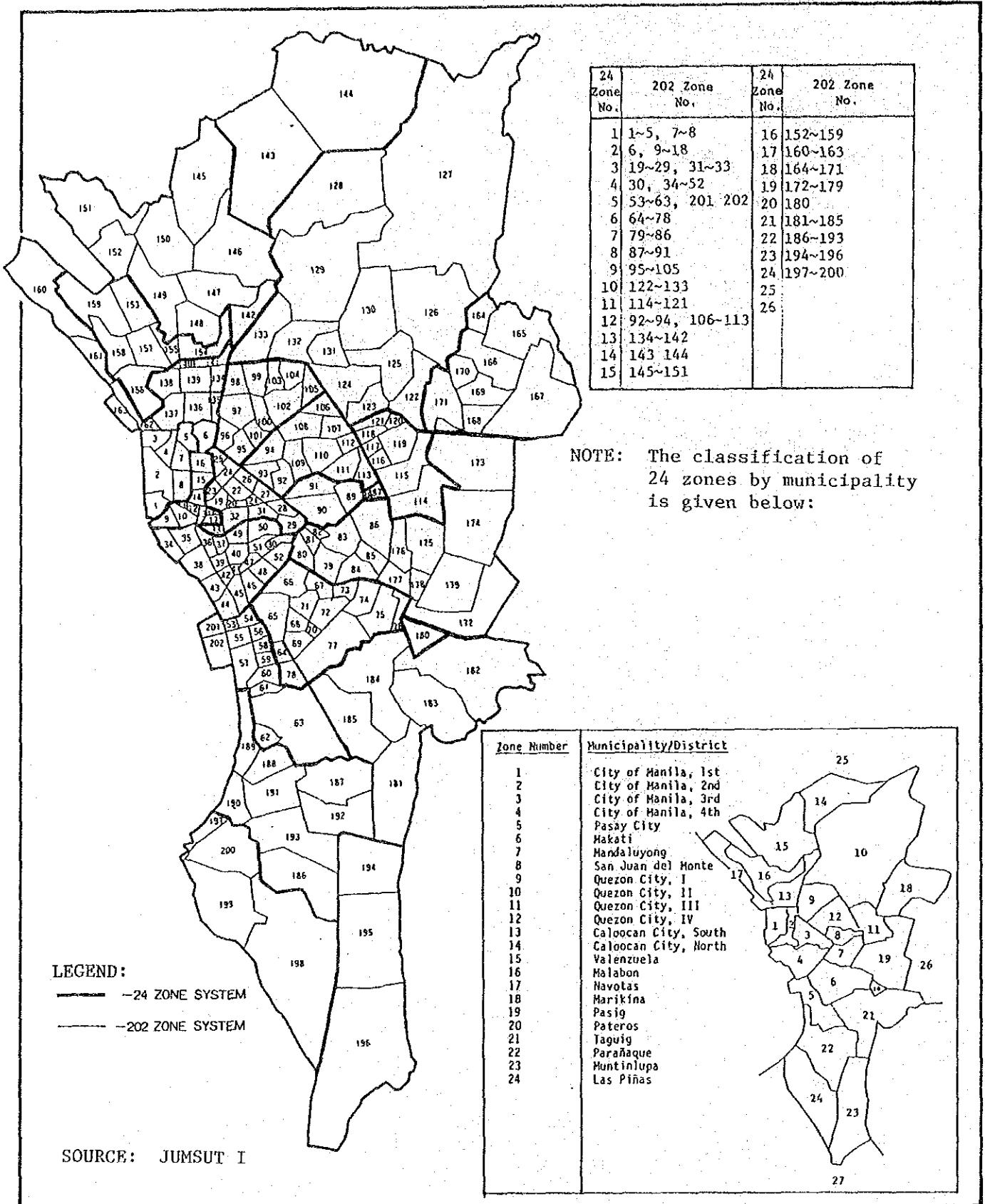
- 1 GHPUB Generation (Pub:Home)
- 2 GWPUB Generation (Pub:Work)
- 3 GSPUB Generation (Pub:School)
- 4 GPPUB Generation (Pub:Private)
- 5 GBFUB Generation (Pub:Business)
- 6 GHFRV Generation (Prv:Home)
- 7 GWFRV Generation (Prv:Work)
- 8 GSPRV Generation (Prv:School)
- 9 GPPRV Generation (Prv:Private)
- 10 GBFRV Generation (Prv:Business)
- 11 AHPUB Attraction (Pub:Home)
- 12 AWPUB Attraction (Pub:Work)
- 13 ASPUB Attraction (Pub:School)
- 14 APPUB Attraction (Pub:Private)
- 15 ABPUB Attraction (Pub:Business)
- 16 AHPRV Attraction (Prv:Home)
- 17 AWPRV Attraction (Prv:Work)
- 18 ASPRV Attraction (Prv:School)
- 19 APPRV Attraction (Prv:Private)
- 20 ABPRV Attraction (Prv:Business)

- f) GATEB.24 : Trip generation and attraction by mode and by purpose, 24 zones. (Mode and purpose are the same as GATEB.202)
- g) ZOD27B.DAT : 27-zone OD tables (24 internal zones plus 3 external zones) by mode and by purpose. (Mode and purpose are the same as GATEB.202)

- 1 : PUBLIC : HOME
- 2 : PRIVATE : HOME
- 3 : PUBLIC : WORK
- 4 : PRIVATE : WORK
- 5 : PUBLIC : SCHOOL
- 6 : PRIVATE : SCHOOL
- 7 : PUBLIC : PRIVATE
- 8 : PRIVATE : PRIVATE
- 9 : PUBLIC : BUSINESS
- 10 : PRIVATE : BUSINESS
- 11 : PUBLIC : TOTAL
- 12 : PRIVATE : TOTAL
- 13 : TOTAL : TOTAL

- h) ZONCV.DAT : Zone conversion table (from 202 zones to either 24 or 58 zones). Refer to Figures 4.2 and 4.3.
- i) NOD24.DAT : (x,y) coordinates of the centroids of the 24 zones.
- j) NOD202.DAT : (x,y) coordinates of the centroids of the 24 zones.
- k) ZONE24.DAT : Data for graphic display of the 24 zones.
- l) ZONE.DAT : Data for graphic display of the 202 zones.

Figure 4.2
Zone Conversion Table and Map
(202 zones to 24 zones)



| 24 Zone No. | 202 Zone No. | 24 Zone No. | 202 Zone No. |
|-------------|-----------------|-------------|--------------|
| 1 | 1~5, 7~8 | 16 | 152~159 |
| 2 | 6, 9~18 | 17 | 160~163 |
| 3 | 19~29, 31~33 | 18 | 164~171 |
| 4 | 30, 34~52 | 19 | 172~179 |
| 5 | 53~63, 201, 202 | 20 | 180 |
| 6 | 64~78 | 21 | 181~185 |
| 7 | 79~86 | 22 | 186~193 |
| 8 | 87~91 | 23 | 194~196 |
| 9 | 95~105 | 24 | 197~200 |
| 10 | 122~133 | 25 | |
| 11 | 114~121 | 26 | |
| 12 | 92~94, 106~113 | | |
| 13 | 134~142 | | |
| 14 | 143, 144 | | |
| 15 | 145~151 | | |

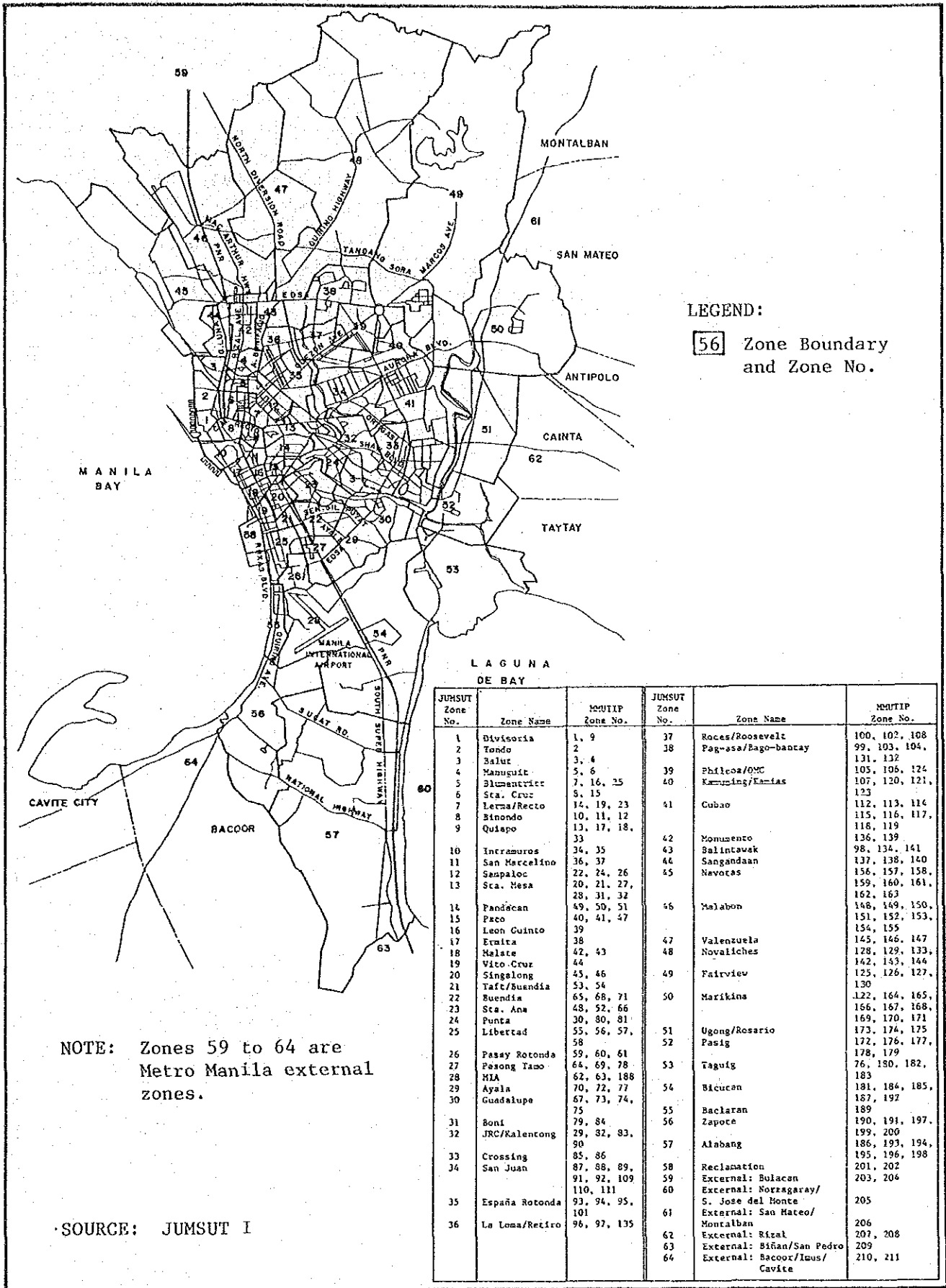
NOTE: The classification of 24 zones by municipality is given below:

| Zone Number | Municipality/District |
|-------------|-----------------------|
| 1 | City of Manila, 1st |
| 2 | City of Manila, 2nd |
| 3 | City of Manila, 3rd |
| 4 | City of Manila, 4th |
| 5 | Pasay City |
| 6 | Makati |
| 7 | Mandaluyong |
| 8 | San Juan del Monte |
| 9 | Quezon City, I |
| 10 | Quezon City, II |
| 11 | Quezon City, III |
| 12 | Quezon City, IV |
| 13 | Caloocan City, South |
| 14 | Caloocan City, North |
| 15 | Valenzuela |
| 16 | Malabon |
| 17 | Navotas |
| 18 | Marikina |
| 19 | Pasig |
| 20 | Pateros |
| 21 | Taguig |
| 22 | Parañaque |
| 23 | Muntinlupa |
| 24 | Las Piñas |

LEGEND:
 ——— -24 ZONE SYSTEM
 ——— -202 ZONE SYSTEM

SOURCE: JUMSUT I

Figure 4.3
Zone Conversion Table and Map
(202 zones to 58 zones)



LEGEND:
56 Zone Boundary and Zone No.

NOTE: Zones 59 to 64 are Metro Manila external zones.

SOURCE: JUMSUT I

| JUMSUT Zone No. | Zone Name | MMUTIP Zone No. | JUMSUT Zone No. | Zone Name | MMUTIP Zone No. |
|-----------------|----------------|-----------------------------------|-----------------|--|--|
| 1 | Divisoria | 1, 9 | 37 | Roces/Roosevelt | 100, 102, 108 |
| 2 | Tondo | 2, 4 | 38 | Fag-asa/Bago-bancay | 99, 103, 104, 131, 132 |
| 3 | Salur | 3, 4 | 39 | Philcoa/OMC | 105, 106, 124 |
| 4 | Manuguit | 5, 6 | 40 | Kamuning/Kamias | 107, 120, 121, 123 |
| 5 | Plamantrier | 7, 16, 25 | 41 | Cubao | 112, 113, 114, 115, 116, 117, 118, 119, 136, 139 |
| 6 | Sta. Cruz | 8, 15 | 42 | Monumento | 98, 134, 141 |
| 7 | Lerna/Recto | 14, 19, 23 | 43 | Balintawak | 137, 138, 140 |
| 8 | Binondo | 10, 11, 12 | 44 | Sangandaan | 156, 157, 158 |
| 9 | Quisapo | 13, 17, 18, 33 | 45 | Navotas | 159, 160, 161, 162, 163 |
| 10 | Intramuros | 34, 35 | 46 | Malabon | 148, 149, 150, 151, 152, 153, 154, 155 |
| 11 | San Marcelino | 36, 37 | 47 | Valenzuela | 145, 146, 147 |
| 12 | Sampaloc | 22, 24, 26 | 48 | Novaliches | 128, 129, 133, 142, 143, 144 |
| 13 | Sta. Mesa | 20, 21, 27, 28, 31, 32 | 49 | Fairview | 125, 126, 127, 130 |
| 14 | Pandacan | 49, 50, 51 | 50 | Marikina | 122, 164, 165, 166, 167, 168, 169, 170, 171 |
| 15 | Paco | 40, 41, 47 | 51 | Ugong/Rosario | 173, 174, 175 |
| 16 | Leon Quinto | 39 | 52 | Pasig | 172, 176, 177, 178, 179 |
| 17 | Erlita | 38 | 53 | Taguig | 76, 180, 182, 183 |
| 18 | Malate | 42, 43 | 54 | Bicayan | 181, 184, 185, 187, 192 |
| 19 | Vito-Cruz | 44 | 55 | Baclaran | 189 |
| 20 | Singalong | 45, 46 | 56 | Zapote | 190, 191, 197, 199, 200 |
| 21 | Taft/Buendia | 53, 54 | 57 | Alabang | 186, 193, 194, 195, 196, 198 |
| 22 | Buendia | 65, 68, 71 | 58 | Reclamation | 201, 202 |
| 23 | Sta. Ana | 48, 52, 66 | 59 | External: Bulacan | 203, 204 |
| 24 | Punta | 30, 80, 81 | 60 | External: Norzagaray/S. Jose del Monte | 205 |
| 25 | Libertad | 55, 56, 57, 58 | 61 | External: San Mateo/Montalban | 206 |
| 26 | Pasay Rotonda | 59, 60, 61 | 62 | External: Rizal | 207, 208 |
| 27 | Pasong Tamo | 64, 69, 78 | 63 | External: Bifan/San Pedro | 209 |
| 28 | MIA | 62, 63, 188 | 64 | External: Bacoor/Imus/Cavite | 210, 211 |
| 29 | Ayala | 70, 72, 77 | | | |
| 30 | Guadalupe | 67, 73, 74, 75 | | | |
| 31 | Boni | 79, 84 | | | |
| 32 | JRC/Kalencong | 29, 32, 83, 90 | | | |
| 33 | Crossing | 85, 86 | | | |
| 34 | San Juan | 87, 88, 89, 91, 92, 109, 110, 111 | | | |
| 35 | España Rotonda | 93, 94, 95, 101 | | | |
| 36 | La Loma/Retiro | 96, 97, 135 | | | |

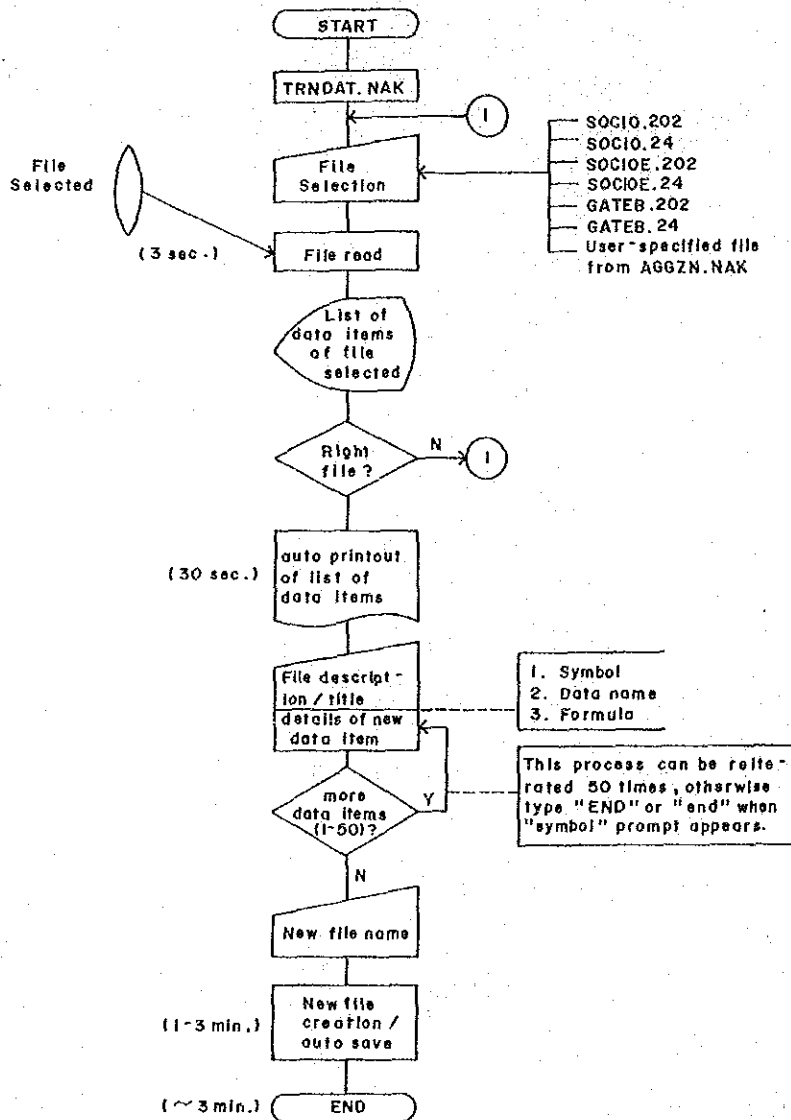
A. TRNDAT.NAK

This program creates a new data file under a name specified by the user, after producing new data calculated from the existing data file.

Although any type of calculation may be accepted in this program, the level of zoning is maintained to be the same as the existing data file specified, as long as only one formula is used to calculate each new item and expressed in BASIC.

The user is requested not to save the program (e.g., after modifying the program) into the same file after usage, because the program modifies itself when operated and the original program will be lost when the modified program is saved over it.

Figure 4.4
Flowchart of TRNDAT.NAK



Operation of TRNDAT.NAK

Remarks

1

Run "TRNDAT.NAK"

→ Program start: load and run the program.

The computer then displays the title of the program "Data Transformation Program". Touch any key to proceed.

2

Input File Name ? SOCIOE.24

→ Specify an existing file. If the file is on the second drive, type "2:" before the file name.

3

Expanded Socio-Economic Data (24 Zones)

No. Symbol Data Name

| | | |
|----|------|--|
| 1 | S | Area (ha) |
| 2 | H | No. of Households |
| 3 | PN | Population |
| 4 | HI/H | Average Household Income (P/H) |
| 5 | RCD | Car Owning Rate (%) |
| 6 | P7N | Population (>6 Years Old) |
| 7 | EN | Employment |
| 8 | E1N | Employment (Primary) |
| 9 | E2N | Employment (Secondary) |
| 10 | E3N | Employment (Tertiary) |
| 11 | RE1N | Rate of Primary Industry in Employment (%) |
| 12 | RE2N | Rate of Secondary Industry in Employment (%) |
| 13 | RE3N | Rate of Tertiary Industry in Employment (%) |
| 14 | STN | No. of Students |
| 15 | P7D | Daytime Population (>6 Years Old) |

→ The computer displays the data items included in the specific file. Touch any key to proceed.

4

Expanded Socio-Economic Data (24 Zones)

No. Symbol Data Name

| | | |
|----|-------|--|
| 16 | ED | Daytime Employment |
| 17 | E1D | Daytime Employment (Primary) |
| 18 | E2D | Daytime Employment (Secondary) |
| 19 | E3D | Daytime Employment (Tertiary) |
| 20 | RE1D | Rate of Primary Industry in Daytime Employment (%) |
| 21 | RE2D | Rate of Secondary Industry in Daytime Employment (%) |
| 22 | RE3D | Rate of Tertiary Industry in Daytime Employment (%) |
| 23 | STD | No. of Students in Daytime |
| 24 | P7N/S | Population Density (>6 Years Old) |
| 25 | P7D/S | Population Density in Daytime (>6 Years Old) |

File is right (Y/N) ? Y

→ File check

*** Expanded Socio-Economic Data (24 Zones) ***

| No. | Symbol | Data Name |
|-----|--------|--|
| 1 | S | Area (ha) |
| 2 | H | No. of Households |
| 3 | PN | Population |
| 4 | HI/H | Average Household Income (P/H) |
| 5 | RCD | Car Owning Rate (%) |
| 6 | P7N | Population (>6 Years Old) |
| 7 | EN | Employment |
| 8 | E1N | Employment (Primary) |
| 9 | E2N | Employment (Secondary) |
| 10 | E3N | Employment (Tertiary) |
| 11 | RE1N | Rate of Primary Industry in Employment (%) |
| 12 | RE2N | Rate of Secondary Industry in Employment (%) |
| 13 | RE3N | Rate of Tertiary Industry in Employment (%) |
| 14 | STN | No. of Students |
| 15 | P7D | Daytime Population (>6 Years Old) |
| 16 | ED | Daytime Employment |
| 17 | E1D | Daytime Employment (Primary) |
| 18 | E2D | Daytime Employment (Secondary) |
| 19 | E3D | Daytime Employment (Tertiary) |
| 20 | RE1D | Rate of Primary Industry in Daytime Employment (%) |
| 21 | RE2D | Rate of Secondary Industry in Daytime Employment (%) |
| 22 | RE3D | Rate of Tertiary Industry in Daytime Employment (%) |
| 23 | STD | No. of Students in Daytime |
| 24 | P7N/S | Population Density (>6 Years Old) |
| 25 | P7D/S | Population Density in Daytime (>6 Years Old) |

→ The computer automatically prints out the data items included in the specified file.

5

Description of New File (to be used as a title) ?
 FORECAST 1995 SOCIO-ECONOMIC DATA

New Data Item 1

Symbol: ? P95

Data Name : ? 1995 PROJECTED POPULATION

Formula (to calculate the above) : ?

$$Y(1) = 1.283 * X(1) + 17.35$$

sure (y/n) ? Y

→ Input title of new file. This title is to be saved as the first line of the new file to be created.

→ Details of new data item: (y(i) is used for the variables of the new file; while x (i) is used for the variables of the existing file).

→ Item check

6

Description of New File (to be used as a title) ?
 FORECAST SOCIO-ECONOMIC DATA FOR 1995

New Data Item 2

Symbol: ? E95

Data Name : ? 1995 PROJECTED EMPLOYMENT

Formula (to calculate the above) : ?

$$Y(2) = 0.3 * X(1) + 0.7 * X(3)$$

sure (y/n) ? Y

→ Indicator of previous data items

→ Details of next data item

→ Item check

→ The above process can be iterated up to 50 times. If the user wants to stop, type "END" or "end" after "SYMBOL" appears.

7

```

New File Name : ? SOC195.24
Break in 1820
Ok
LIST 1820
1820 STOP
Ok
FILES
GA      DAT 3  CONDAT NAK 1  PRIDAT NAK 1  HGRAPHI NAK 1  SOC10  DAT 13
ZOD27  DAT 7  GATRIP DAT 5  filecp sub 1  TRNS  SUB 1  PWRK  PRO 1
cif     sub 1  color  1  OCP  HOH 4  OCP  WRK 4  EHP  WRK 4
EMP     HOH 4  HKFL  NAK 1  area  1  hous  1  MAP  NAK 1
ZONE24 DAT 1  HKFL2 NAK 1  SOC10 TRN 1  SOC10 DDD 4  HKFL3 NAK 1
HKFL4  NAK 1  SOC10 AAA 3  THOR  1  TRNDAT NAK 1  XWORK  PRO 1
AGGRN  NAK 1  ZONCV  DAT 1  SOC195 24 1  ZON202 DAT 2  SOC10X 58 2
MAP     1  PATIMP NAK 1  submax  1  settle  1  submap  1
subdra w 1  NOD24  DAT 1  HKOD  NAK 1  ZOD270 DAT 7  HLOA  NAK 1
GATED  DAT 6  ODLIN  NAK 1  odleg  sub 1  HKGAZ  NAK 1  SOC10X 24 1
GATED  24 1  GATED  202 6  NOD202 DAT 1  ZONE  DAT 2  CHECK  1
backsp n88 1  modt11 1  SOC10  202 5  rfiles n88 1  SOC10E 202 8
SOC10  24 1  SOC10E 24 2
Ok
  
```

→ Input name of user-specified file where transformed data is to be stored. Then the computer creates a new file using the calculated data.

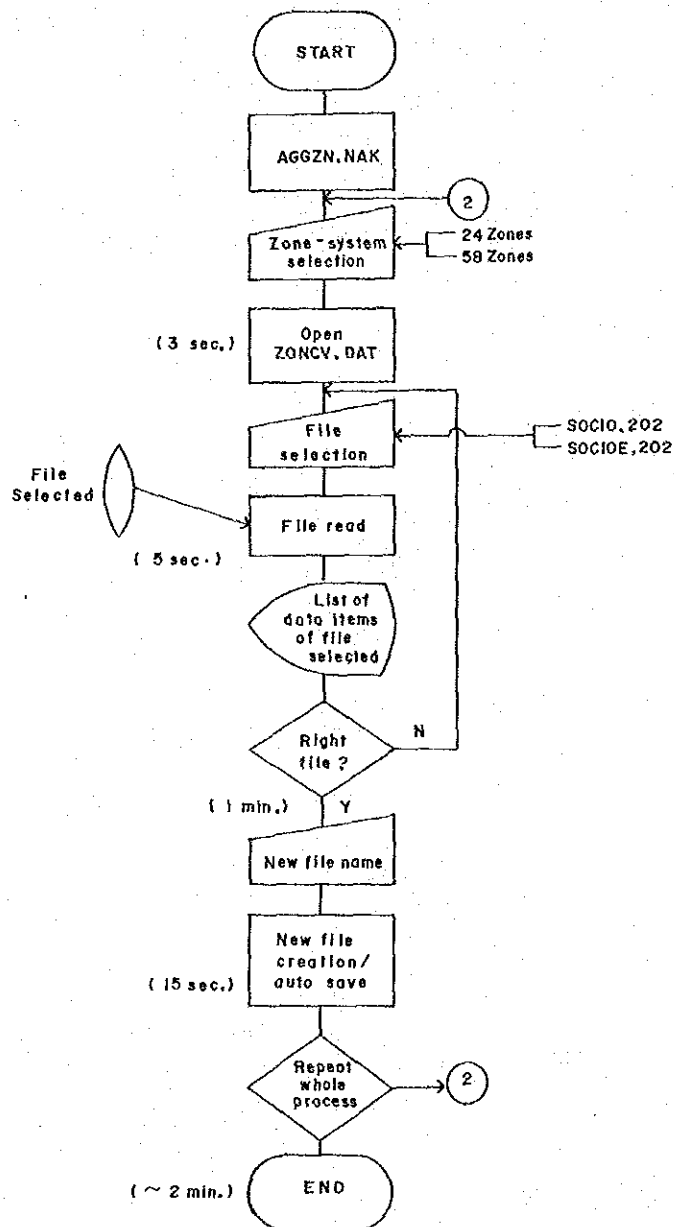
↘ Type this to check if transformed data file has been properly added to program/data file list.

B. AGGZN.NAK

This program aggregates the zonal data from the 202-zone basis to either the 24-zone system or the 58-zone system. If the data file "ZONCV.DAT" is modified in an appropriate manner, other zoning systems may be dealt with by AGGZN.NAK.

The aggregate data are stored in a new file, which can be used by TRNDAT.NAK, PRIDAT.NAK, and HGRAPH.NAK. If the JUMSUT 58-zone system is selected, PAINMP.NAK and ODLIN.NAK are not applicable due to the non-availability of a zone map and OD table data.

Figure 4.5
Flowchart of AGGZN.NAK



Operation of AGGZN.NAK

Remarks

1

Run "AGGZN.NAK" → Program start: load and run the program.

The computer displays the title of the program "Zone Aggregate Program". Touch any key to proceed.

2

ZONE LEVEL 24 : 1 → Zone-system menu selection

ZONE LEVEL 58 : 2

Select No. (1 or 2)? 1

Input File Name ? SOCIOE.202 → Input data file name selected.

3

Expanded Socio-Economic Data (202 Zones) → Data file items display

| No. | Symbol | Data Name |
|-----|--------|--|
| 1 | S | Area (ha) |
| 2 | H | No. of Households |
| 3 | PN | Population |
| 4 | H1/H | Average Household Income (P/H) |
| 5 | RCO | Car Owning Rate (%) |
| 6 | P7N | Population (>6 Years Old) |
| 7 | EN | Employment |
| 8 | E1N | Employment (Primary) |
| 9 | E2N | Employment (Secondary) |
| 10 | E3N | Employment (Tertiary) |
| 11 | RE1N | Rate of Primary Industry in Employment (%) |
| 12 | RE2N | Rate of Secondary Industry in Employment (%) |
| 13 | RE3N | Rate of Tertiary Industry in Employment (%) |
| 14 | STN | No. of Students |
| 15 | P7D | Daytime Population (>6 Years Old) |

→ Press any key to continue.

4

Expanded Socio-Economic Data (202 Zones)

| No. | Symbol | Data Name |
|-----|--------|--|
| 16 | ED | Daytime Employment |
| 17 | E1D | Daytime Employment (Primary) |
| 18 | E2D | Daytime Employment (Secondary) |
| 19 | E3D | Daytime Employment (Tertiary) |
| 20 | RE1D | Rate of Primary Industry in Daytime Employment (%) |
| 21 | RE2D | Rate of Secondary Industry in Daytime Employment (%) |
| 22 | RE3D | Rate of Tertiary Industry in Daytime Employment (%) |
| 23 | STI | No. of Students in Daytime |
| 24 | P7N/S | Population Density (>6 Years Old) |
| 25 | F7D/S | Population Density in Daytime (>6 Years Old) |
| 26 | PD | Daytime Population - Calculated employment (%) |
| 27 | PN/B | Population Density Industry in Employment (%) |
| 28 | PD/B | Daytime Population Density in Employment (%) |
| 29 | PN/H | Average Household Size |
| 30 | ED/EN | Ratio of Daytime Employment to Nighttime |

File is right (Y/N) ? Y

File check

5

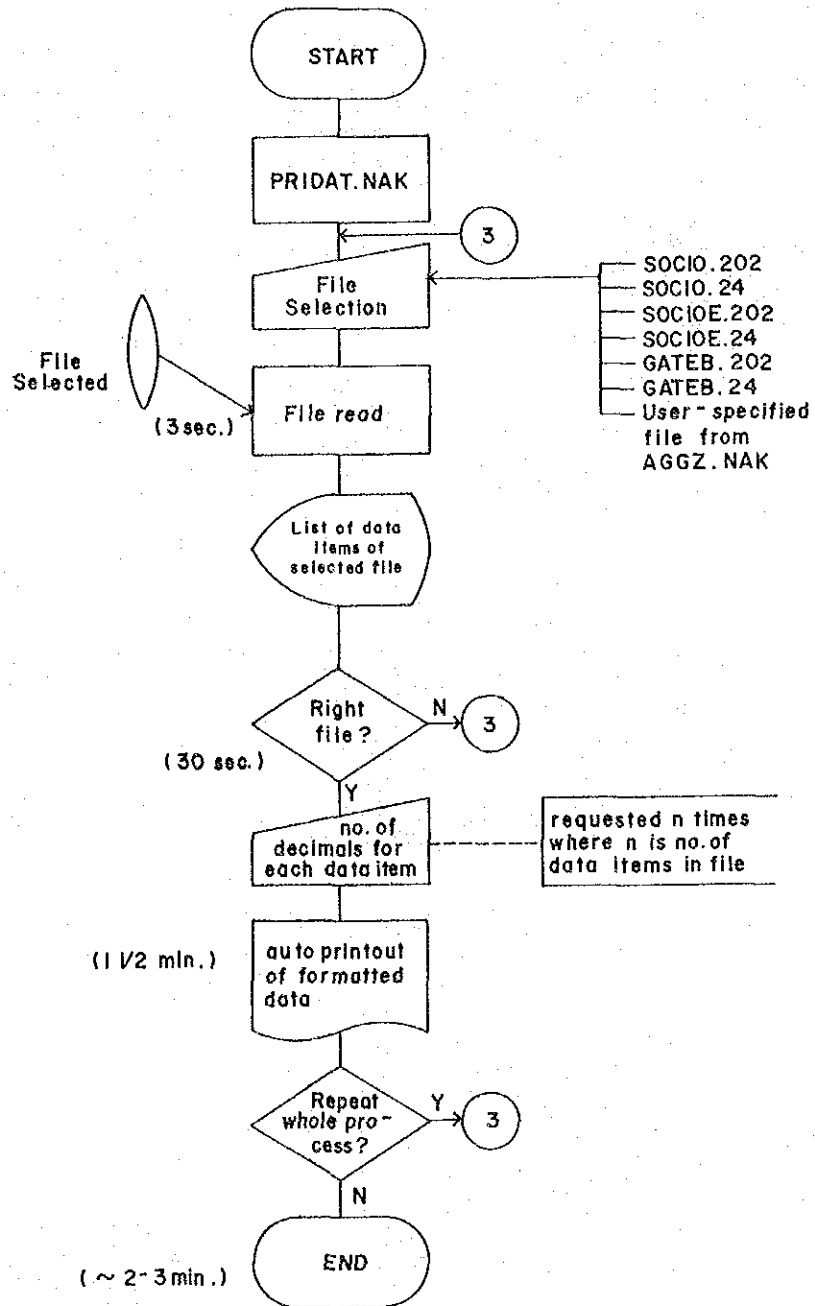
NEW FILE NAME : ? SOCIOX.24

Input new file name for aggregated data. (Aggregate data output may be used by TRNDAT.NAK, PRIDAT.NAK, HGRAPH.NAK - for 24 and 58 zones; and PAINMP.NAK - for 24 zones only) Then the computer creates a new 24-zone-based data file on the diskette.

C. PRIDAT.NAK

This program prints out the contents of data files on socio-economic characteristics and trip generation/attraction.

Figure 4.6
Flowchart of PRIDAT.NAK



Operation of PRIDAT.NAK

Remarks

1

Run "PRIDAT.NAK"

→ Program start: load and run the program.

The computer displays the title of the program "Data Printout Program". Press any key to proceed.

2

Input File Name ? SOCIOE.24

→ Input data file name selected.

3

Expanded Socio-Economic Data (24 Zones)

No. Symbol Data Name

| | | |
|----|------|--|
| 1 | S | Area (ha) |
| 2 | H | No. of Households |
| 3 | PN | Population |
| 4 | HI/H | Average Household Income (P/H) |
| 5 | KCU | Car Owning Rate (%) |
| 6 | P7N | Population (>6 Years Old) |
| 7 | EN | Employment |
| 8 | E1N | Employment (Primary) |
| 9 | E2N | Employment (Secondary) |
| 10 | E3N | Employment (Tertiary) |
| 11 | RE1N | Rate of Primary Industry in Employment (%) |
| 12 | RE2N | Rate of Secondary Industry in Employment (%) |
| 13 | RE3N | Rate of Tertiary Industry in Employment (%) |
| 14 | STN | No. of Students |
| 15 | P7D | Daytime Population (>6 Years Old) |

→ Data file items display

→ Press any key to continue.

4

Expanded Socio-Economic Data (24 Zones)

No. Symbol Data Name

| | | |
|----|-------|--|
| 16 | ED | Daytime Employment |
| 17 | E1D | Daytime Employment (Primary) |
| 18 | E2D | Daytime Employment (Secondary) |
| 19 | E3D | Daytime Employment (Tertiary) |
| 20 | RE1D | Rate of Primary Industry in Daytime Employment (%) |
| 21 | RE2D | Rate of Secondary Industry in Daytime Employment (%) |
| 22 | RE3D | Rate of Tertiary Industry in Daytime Employment (%) |
| 23 | STD | No. of Students in Daytime |
| 24 | P7N/S | Population Density (>6 Years Old) |
| 25 | P7D/S | Population Density in Daytime (>6 Years Old) |
| 26 | PD | Daytime Population - Calculated Employment (%) |
| 27 | PN/S | Population Density Employment (%) |
| 28 | PD/S | Daytime Population Density Employment (%) |
| 29 | FN/H | Average Household Size |
| 30 | ED/EN | Ratio of Daytime Employment to Nighttime |

File is right (Y/N)? Y

Press No. of Decimals you want (0-7) for each data item. 8 or 9 exponential.

For Item No. 25?

→ File check

For items 1 to n,
where n = 25 for SOCIOE.24/202;
where n = 17 for SOCIO.24/202;
where n = 20 for GATEB.24/202.

This process is reiterated until it reaches up to the number of data items included.

Expanded Socio-Economic Data (24 Zones)

- 1 S Area (ha)
- 2 H No. of Households
- 3 PN Population
- 4 HI/H Average Household Income (P/H)
- 5 RCD Car Owning Rate (%)
- 6 P7N Population (>6 Years Old)
- 7 EN Employment
- 8 EIN Employment (Primary)
- 9 E2N Employment (Secondary)
- 10 E3N Employment (Tertiary)
- 11 RE1N Rate of Primary Industry in Employment (%)
- 12 RE2N Rate of Secondary Industry in Employment (%)
- 13 RE3N Rate of Tertiary Industry in Employment (%)
- 14 STN No. of Students
- 15 P7D Daytime Population (>6 Years Old)
- 16 ED Daytime Employment
- 17 E1D Daytime Employment (Primary)
- 18 E2D Daytime Employment (Secondary)
- 19 E3D Daytime Employment (Tertiary)
- 20 RE1D Rate of Primary Industry in Daytime Employment (%)
- 21 RE2D Rate of Secondary Industry in Daytime Employment (%)
- 22 RE3D Rate of Tertiary Industry in Daytime Employment (%)
- 23 STD No. of Students in Daytime
- 24 P7D/S Population Density (/ha)
- 25 P7D/S Population Density in Daytime (/ha)

Automatic print-out of data file (list of items and contents)

*** Expanded Socio-Economic Data (24 Zones) ***

| | S | H | PN | HI/H | RCD | P7N | EN | E1N | E2N | E3N | RE1N | RE2N | RE3N |
|----|---------|----------|----------|--------|------|----------|----------|--------|---------|----------|------|------|------|
| 1 | 787.5 | 103069.0 | 565319.0 | 879.7 | 5.4 | 464725.0 | 167922.0 | 458.2 | 43030.8 | 124435.0 | 0.3 | 25.6 | 74.1 |
| 2 | 610.1 | 40718.0 | 218175.0 | 360.0 | 7.7 | 179991.0 | 68664.4 | 356.0 | 13756.8 | 54551.8 | 0.3 | 20.0 | 79.4 |
| 3 | 914.4 | 81077.0 | 428361.0 | 1110.5 | 6.7 | 352494.0 | 122792.0 | 488.2 | 24132.6 | 98170.9 | 0.4 | 19.7 | 79.9 |
| 4 | 1518.9 | 75511.0 | 418430.0 | 1030.9 | 6.2 | 344368.0 | 123997.0 | 334.5 | 30501.2 | 93161.6 | 0.3 | 24.6 | 75.1 |
| 5 | 1586.2 | 55236.0 | 287770.0 | 1091.3 | 8.3 | 232683.0 | 82832.3 | 135.1 | 15451.0 | 67266.3 | 0.2 | 18.6 | 81.2 |
| 6 | 2979.6 | 69053.0 | 372631.0 | 1344.2 | 12.6 | 306955.0 | 118829.0 | 83.6 | 27766.9 | 90978.6 | 0.1 | 23.4 | 76.6 |
| 7 | 1110.3 | 38881.0 | 205368.0 | 1263.0 | 13.0 | 166847.0 | 66084.1 | 287.0 | 21588.5 | 44290.6 | 0.4 | 32.5 | 67.0 |
| 8 | 557.8 | 23520.0 | 130888.0 | 1235.7 | 12.8 | 107709.0 | 40384.8 | 0.0 | 9293.2 | 31090.6 | 0.0 | 23.0 | 77.0 |
| 9 | 1488.9 | 50970.0 | 271416.0 | 1131.4 | 15.2 | 223192.0 | 86930.7 | 319.0 | 21619.7 | 64992.0 | 0.4 | 24.9 | 74.8 |
| 10 | 12256.5 | 87878.0 | 472154.0 | 1161.8 | 11.0 | 387858.0 | 144217.0 | 688.1 | 40988.2 | 102551.0 | 0.5 | 28.4 | 71.1 |
| 11 | 1339.7 | 35881.0 | 189295.0 | 1478.1 | 18.5 | 155716.0 | 63349.1 | 79.0 | 14629.3 | 48640.8 | 0.1 | 23.1 | 76.8 |
| 12 | 1531.7 | 43717.0 | 233090.0 | 1135.5 | 14.0 | 191625.0 | 70742.0 | 551.1 | 15180.9 | 55010.1 | 0.8 | 21.5 | 77.8 |
| 13 | 1276.9 | 75757.0 | 395082.0 | 1107.0 | 5.2 | 315204.0 | 113976.0 | 134.0 | 31706.8 | 82135.3 | 0.1 | 27.8 | 72.1 |
| 14 | 4301.4 | 13603.0 | 72734.0 | 975.7 | 10.0 | 57992.6 | 20309.6 | 438.2 | 9060.0 | 10811.5 | 2.2 | 44.8 | 53.2 |
| 15 | 4702.1 | 39953.0 | 212363.0 | 1190.8 | 8.1 | 166826.0 | 55253.6 | 1192.9 | 20356.8 | 33704.2 | 2.2 | 36.8 | 61.0 |
| 16 | 2333.6 | 36353.0 | 191001.0 | 1044.1 | 7.1 | 152386.0 | 54533.3 | 429.3 | 18838.3 | 35265.8 | 0.8 | 34.5 | 64.7 |
| 17 | 1037.8 | 23210.0 | 126146.0 | 991.1 | 3.1 | 98563.2 | 35066.8 | 1326.3 | 7227.0 | 26511.5 | 3.8 | 20.6 | 75.6 |
| 18 | 3892.4 | 38919.0 | 211613.0 | 1244.2 | 7.9 | 188553.0 | 65985.2 | 510.1 | 29471.2 | 35983.9 | 0.8 | 44.7 | 54.5 |
| 19 | 3262.5 | 50288.0 | 268570.0 | 1142.8 | 6.2 | 214027.0 | 82644.8 | 705.0 | 35359.7 | 46580.1 | 0.9 | 42.8 | 56.4 |
| 20 | 260.0 | 7269.0 | 40288.0 | 1149.0 | 14.4 | 31716.7 | 12095.3 | 0.0 | 2691.7 | 9403.6 | 0.0 | 22.3 | 77.7 |
| 21 | 3371.1 | 25145.0 | 134137.0 | 1072.4 | 5.1 | 104551.0 | 40005.4 | 371.6 | 16628.3 | 23005.6 | 0.9 | 41.6 | 57.5 |
| 22 | 3833.5 | 37517.0 | 208552.0 | 1720.8 | 24.0 | 171475.0 | 69017.0 | 123.0 | 21331.7 | 47562.3 | 0.2 | 30.9 | 68.9 |
| 23 | 4850.4 | 27171.0 | 151989.0 | 891.9 | 7.5 | 119618.0 | 45116.4 | 184.2 | 18833.0 | 26099.2 | 0.4 | 41.7 | 57.8 |
| 24 | 3978.0 | 22115.0 | 121204.0 | 1511.4 | 21.8 | 94914.4 | 39090.3 | 170.8 | 13040.1 | 25879.4 | 0.4 | 33.4 | 66.2 |

*** Expanded Socio-Economic Data (24 Zones) ***

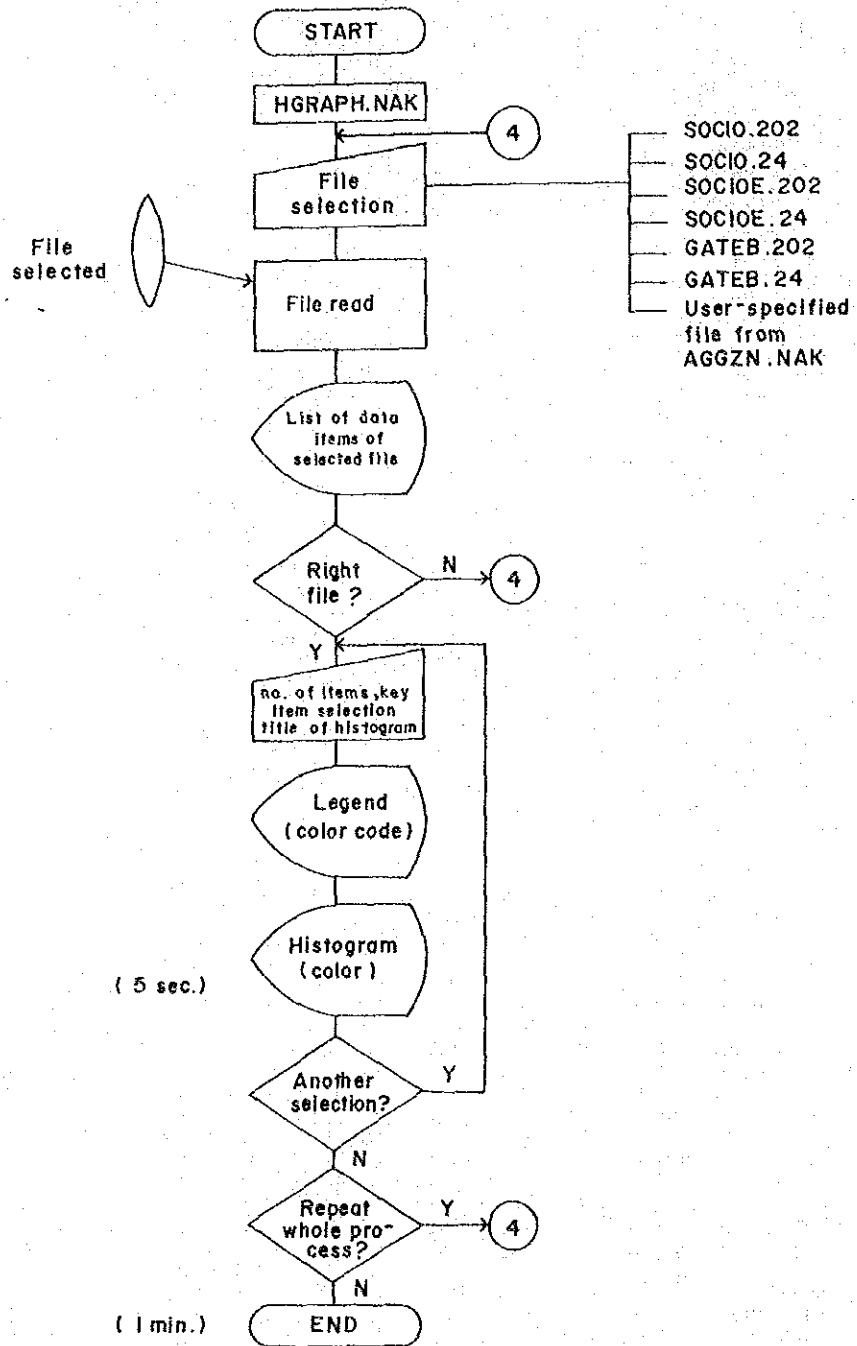
| | STN | P7D | ED | E1D | E2D | E3D | RE1D | RE2D | RE3D | STD | P7N/S | P7D/S | PD |
|----|----------|----------|----------|--------|---------|----------|------|------|------|----------|-------|-------|----------|
| 1 | 158671.0 | 340688.0 | 92967.9 | 227.3 | 25463.1 | 67277.5 | 0.2 | 27.4 | 72.4 | 109376.0 | 590.1 | 432.6 | 441070.0 |
| 2 | 63807.6 | 351399.0 | 154092.0 | 202.7 | 23645.5 | 130243.0 | 0.1 | 15.3 | 84.5 | 150198.0 | 294.2 | 576.0 | 389993.0 |
| 3 | 136722.0 | 472698.0 | 80167.0 | 98.5 | 12917.6 | 67146.8 | 0.1 | 16.1 | 83.8 | 299440.0 | 385.5 | 516.9 | 548450.0 |
| 4 | 127074.0 | 482114.0 | 198755.0 | 370.6 | 30438.1 | 165258.0 | 0.2 | 15.5 | 84.3 | 192562.0 | 226.7 | 317.4 | 556186.0 |
| 5 | 80462.2 | 205326.0 | 5676.7 | 190.3 | 12335.7 | 61150.7 | 0.3 | 16.7 | 83.0 | 62317.1 | 146.7 | 129.4 | 260449.0 |
| 6 | 105686.0 | 355499.0 | 202755.0 | 729.5 | 43562.8 | 158463.0 | 0.4 | 21.5 | 78.2 | 70347.3 | 103.0 | 119.3 | 421218.0 |
| 7 | 57508.8 | 163045.0 | 66303.2 | 193.2 | 26132.7 | 39977.3 | 0.3 | 39.4 | 60.3 | 53309.6 | 150.3 | 146.9 | 201386.0 |
| 8 | 35628.8 | 80392.0 | 26367.8 | 41.5 | 6776.9 | 19549.5 | 0.2 | 25.7 | 74.1 | 22965.8 | 193.1 | 144.1 | 103410.0 |
| 9 | 78845.1 | 175731.0 | 67728.0 | 127.1 | 20353.3 | 47247.5 | 0.2 | 30.1 | 69.8 | 50528.7 | 149.9 | 118.0 | 223897.0 |
| 10 | 135032.0 | 352237.0 | 137133.0 | 434.1 | 44034.7 | 92664.2 | 0.3 | 32.1 | 67.6 | 114442.0 | 31.6 | 29.1 | 441480.0 |
| 11 | 58736.6 | 147014.0 | 71486.0 | 184.6 | 15358.7 | 55942.7 | 0.3 | 21.5 | 78.3 | 44259.1 | 116.2 | 109.7 | 182954.0 |
| 12 | 68483.0 | 176424.0 | 64426.8 | 161.5 | 14338.4 | 49926.9 | 0.3 | 22.3 | 77.5 | 59445.7 | 125.1 | 115.2 | 217647.0 |
| 13 | 110754.0 | 260541.0 | 83180.2 | 50.0 | 23881.9 | 59248.3 | 0.1 | 28.7 | 71.2 | 86669.3 | 246.9 | 204.0 | 340201.0 |
| 14 | 18805.8 | 38771.7 | 6913.2 | 438.2 | 1879.9 | 4595.2 | 6.3 | 27.2 | 66.5 | 12981.3 | 13.5 | 9.0 | 53513.1 |
| 15 | 60462.7 | 153849.0 | 55308.0 | 1596.5 | 25683.4 | 28028.1 | 2.9 | 46.4 | 50.7 | 47356.0 | 35.5 | 32.7 | 199311.0 |
| 16 | 53774.9 | 133090.0 | 37045.5 | 252.0 | 13637.6 | 23155.9 | 0.7 | 36.8 | 62.5 | 51739.0 | 65.3 | 57.0 | 171477.0 |
| 17 | 36666.5 | 75997.3 | 25379.0 | 1556.4 | 6214.5 | 17608.1 | 6.1 | 24.5 | 69.4 | 23447.2 | 95.0 | 73.2 | 103239.0 |
| 18 | 61884.8 | 142986.0 | 52257.1 | 492.4 | 27890.4 | 23874.3 | 0.9 | 53.4 | 45.7 | 49789.5 | 43.3 | 38.7 | 185810.0 |
| 19 | 77990.7 | 210057.0 | 90921.2 | 642.0 | 44007.8 | 46271.4 | 0.7 | 48.4 | 50.9 | 65608.7 | 65.6 | 64.4 | 264554.0 |
| 20 | 10866.0 | 27670.4 | 7148.5 | 0.0 | 1264.6 | 5883.9 | 0.0 | 17.7 | 82.3 | 11766.5 | 122.0 | 106.4 | 36241.7 |
| 21 | 35491.6 | 96204.1 | 40511.5 | 298.2 | 20135.0 | 20078.3 | 0.7 | 49.7 | 49.6 | 26639.0 | 31.0 | 28.5 | 125791.0 |
| 22 | 60115.8 | 126149.0 | 50419.4 | 42.1 | 20761.3 | 29615.9 | 0.1 | 41.2 | 58.7 | 33460.7 | 44.7 | 32.9 | 163299.0 |
| 23 | 40799.4 | 118434.0 | 46033.4 | 265.7 | 20453.6 | 25314.2 | 0.6 | 44.4 | 55.0 | 38655.4 | 24.7 | 24.4 | 150762.0 |
| 24 | 32265.3 | 73020.2 | 27724.6 | 170.8 | 11328.7 | 16225.1 | 0.6 | 40.9 | 58.5 | 21519.2 | 23.9 | 18.4 | 99092.2 |

D. HGRAPH.NAK

This program creates a histogram based on a specified file of socio-economic data or trip generation/attraction.

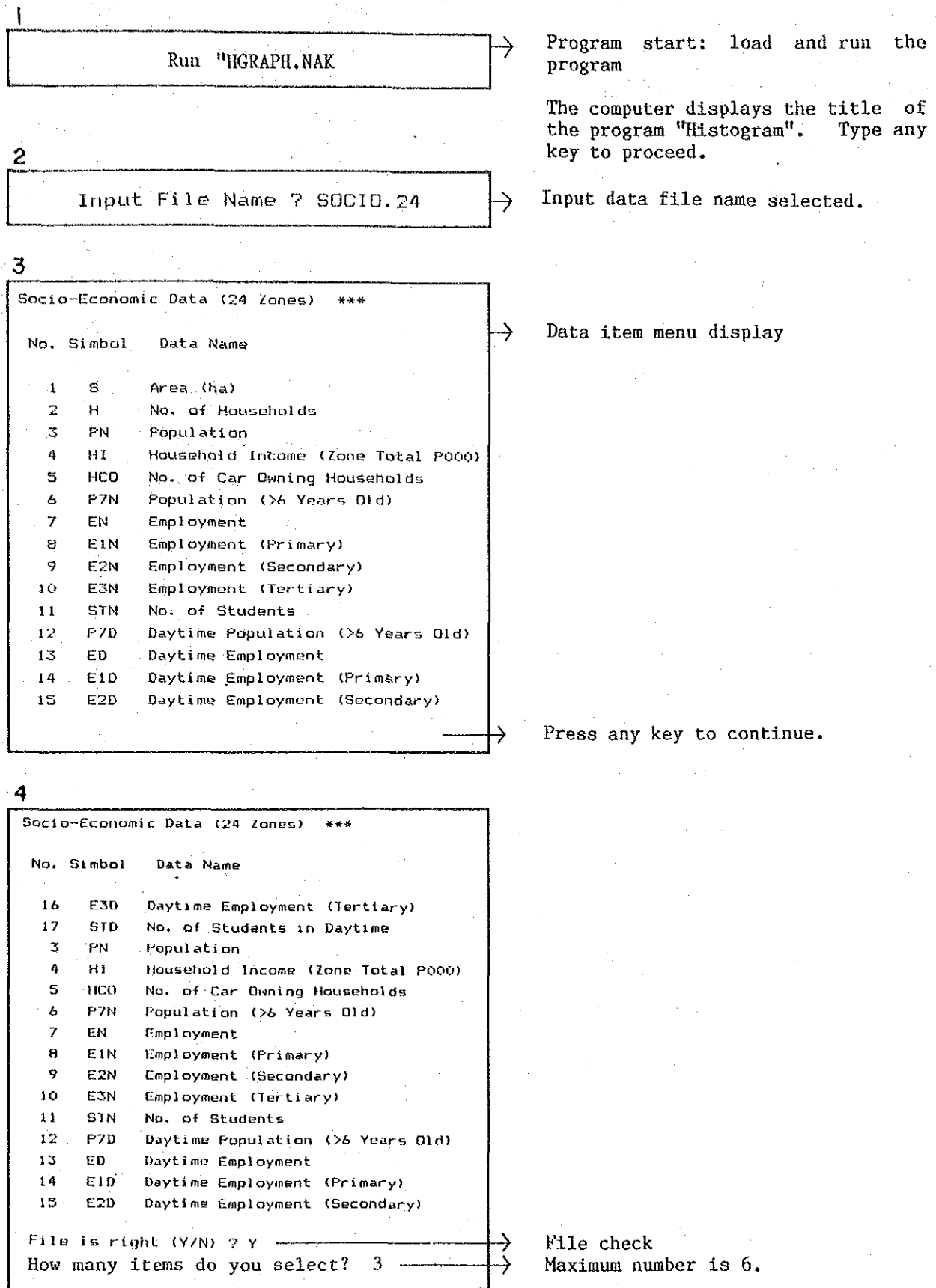
The user has to specify both the number of items to be displayed at the same time and the file name.

Figure 4.7
Flowchart of HGRAPH.NAK



Operation of HGRAPH.NAK

Remarks



5

Socio-Economic Data (24 Zones) ***

| No. | Symbol | Data Name |
|-----|--------|------------------------------------|
| 1 | B | Area (ha) |
| 2 | H | No. of Households |
| 3 | PN | Population |
| 4 | HI | Household Income (Zone Total P000) |
| 5 | HCO | No. of Car Owning Households |
| 6 | P7N | Population (>6 Years Old) |
| 7 | EN | Employment |
| 8 | E1N | Employment (Primary) |
| 9 | E2N | Employment (Secondary) |
| 10 | E3N | Employment (Tertiary) |
| 11 | STN | No. of Students |
| 12 | P7D | Daytime Population (>6 Years Old) |
| 13 | ED | Daytime Employment |
| 14 | E1D | Daytime Employment (Primary) |
| 15 | E2D | Daytime Employment (Secondary) |

→ The computer will display the data item menu selection again as in screens 3 and 4.

6

Socio-Economic Data (24 Zones) ***

| No. | Symbol | Data Name |
|-----|--------|------------------------------------|
| 16 | E3D | Daytime Employment (Tertiary) |
| 17 | STD | No. of Students in Daytime |
| 3 | PN | Population |
| 4 | HI | Household Income (Zone Total P000) |
| 5 | HCO | No. of Car Owning Households |
| 6 | P7N | Population (>6 Years Old) |
| 7 | EN | Employment |
| 8 | E1N | Employment (Primary) |
| 9 | E2N | Employment (Secondary) |
| 10 | E3N | Employment (Tertiary) |
| 11 | STN | No. of Students |
| 12 | P7D | Daytime Population (>6 Years Old) |
| 13 | ED | Daytime Employment |
| 14 | E1D | Daytime Employment (Primary) |
| 15 | E2D | Daytime Employment (Secondary) |

Select No. n? _____

→ For items 1 to n, where n is number of selected items (see screen no. 4)

7

Title of Histogram ?
SOCIO-ECONOMIC DATA BY ZONE 1980

→ Manual input of the title of the histogram.

8

*** L E G E N D ***

▨ : No. of Households

▩ : Population

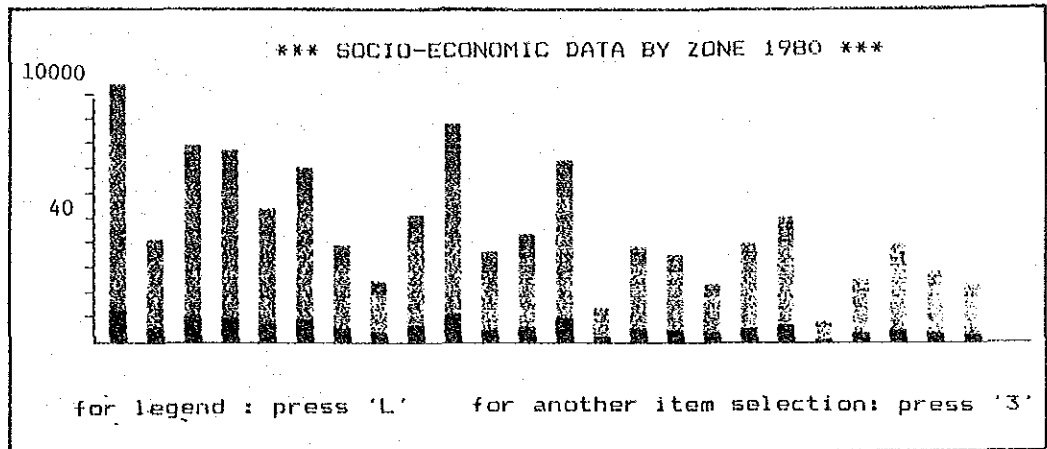
■ : Employment

→ Legend for histogram

Then the computer displays the histogram. After this, the user can select the following options:

- L : Display of legend
- 3 : Display of next screen or another selection of items, if it is the last screen.
- 1 : Display of the previous screen
- 2 : Display of the same screen

9

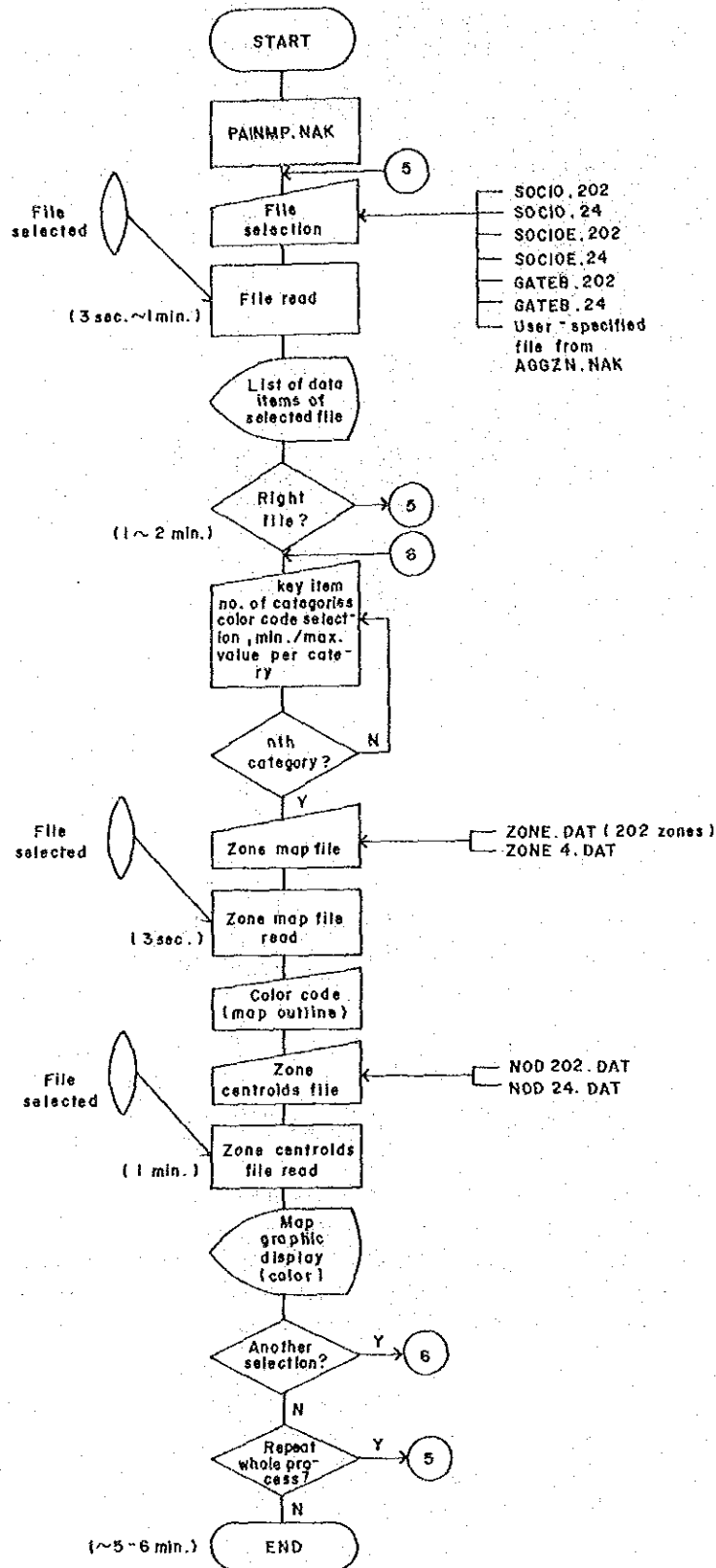


E. PAINMP.NAK

This program presents a display of the socio-economic characteristics of traffic zones based on either the 202-zone system or the 24-zone system.

If the data files of zone maps (like ZONE.DAT and ZONE24.DAT), zone centroids (like NOD202.DAT and NOD24.DAT) and zonal characteristics (socio-economic data for SOCIO.202, SOCIOE.202, SOCIO.24 and SOCIOE.24 and trip generation/attraction for GATEB.202 and GATEB.24) are properly converted or created according to a zoning system, this program can also be applied to these new zones. It is noteworthy that socio-economic data and trip generation/attraction can be easily created for any new zoning system using AGGZN.NAK as long as it is an aggregation of the 202 zones.

Figure 4.8
Flowchart of PAINMP.NAK



Operation of PAINMP.NAK

Remarks

1

Run "PAINMP.NAK"

 → Program start: load and run the program

The computer displays a title "Drawing Color Maps". Type any key to proceed.

2

Input File Name ? SOCIOE.202

 → Input data file name selected.

3

Expanded Socio-Economic Data (24 Zones)

| No. | Symbol | Data Name |
|-----|--------|--|
| 1 | S | Area (ha) |
| 2 | H | No. of Households |
| 3 | PN | Population |
| 4 | HI/H | Average Household Income (P/H) |
| 5 | RCD | Car Owning Rate (%) |
| 6 | P7N | Population (>6 Years Old) |
| 7 | EN | Employment |
| 8 | E1N | Employment (Primary) |
| 9 | E2N | Employment (Secondary) |
| 10 | E3N | Employment (Tertiary) |
| 11 | RE1N | Rate of Primary Industry in Employment (%) |
| 12 | RE2N | Rate of Secondary Industry in Employment (%) |
| 13 | RE3N | Rate of Tertiary Industry in Employment (%) |
| 14 | STN | No. of Students |
| 15 | P7D | Daytime Population (>6 Years Old) |

 → Data item menu display

→ Press any key to continue.

4

Expanded Socio-Economic Data (202 Zones)

| No. | Symbol | Data Name |
|-----|--------|--|
| 16 | ED | Daytime Employment |
| 17 | E1D | Daytime Employment (Primary) |
| 18 | E2D | Daytime Employment (Secondary) |
| 19 | E3D | Daytime Employment (Tertiary) |
| 20 | RE1D | Rate of Primary Industry in Daytime Employment (%) |
| 21 | RE2D | Rate of Secondary Industry in Daytime Employment (%) |
| 22 | RE3D | Rate of Tertiary Industry in Daytime Employment (%) |
| 23 | STD | No. of Students in Daytime |
| 24 | P7D/S | Population Density (/ha) |
| 25 | P7D/S | Population Density in Daytime (/ha) |
| 11 | RE1N | Rate of Primary Industry in Employment (%) |
| 12 | RE2N | Rate of Secondary Industry in Employment (%) |
| 13 | RE3N | Rate of Tertiary Industry in Employment (%) |
| 14 | STN | No. of Students |
| 15 | P7D | Daytime Population (>6 Years Old) |

File is right (Y/N)? Y

 → File check

5

Expanded Socio-Economic Data (202 Zones)

| No. | Symbol | Data Name |
|-----|--------|--|
| 1 | S | Area (ha) |
| 2 | H | No. of Households |
| 3 | PN | Population |
| 4 | HI/H | Average Household Income (P/H) |
| 5 | RCO | Car Owning Rate (%) |
| 6 | P7N | Population (>6 Years Old) |
| 7 | EN | Employment |
| 8 | E1N | Employment (Primary) |
| 9 | E2N | Employment (Secondary) |
| 10 | E3N | Employment (Tertiary) |
| 11 | RE1N | Rate of Primary Industry in Employment (%) |
| 12 | RE2N | Rate of Secondary Industry in Employment (%) |
| 13 | RE3N | Rate of Tertiary Industry in Employment (%) |
| 14 | STN | No. of Students |
| 15 | P7D | Daytime Population (>6 Years Old) |
| 16 | ED | Daytime Employment |
| 17 | E1D | Daytime Employment (Primary) |
| 18 | E2D | Daytime Employment (Secondary) |
| 19 | E3D | Daytime Employment (Tertiary) |
| 20 | RE1D | Rate of Primary Industry in Daytime Employment (%) |
| 21 | RE2D | Rate of Secondary Industry in Daytime Employment (%) |
| 22 | RE3D | Rate of Tertiary Industry in Daytime Employment (%) |
| 23 | STD | No. of Students in Daytime |
| 24 | P7D/S | Population Density (/ha) |
| 25 | P7D/S | Population Density in Daytime (/ha) |
| 11 | RE1N | Rate of Primary Industry in Employment (%) |
| 12 | RE2N | Rate of Secondary Industry in Employment (%) |
| 13 | RE3N | Rate of Tertiary Industry in Employment (%) |
| 14 | STN | No. of Students |
| 15 | P7D | Daytime Population (>6 Years Old) |

Select No. :? 2

→ Data item menu selection display

→ Item selection

6

*** COLOR CODE GUIDE ***

| | | | | | | | | |
|----|----|----|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 |

LEGEND

□ : 0 - 20000

*** No. of Households ***
 Max = 29059 Min = 0 Ave = 5459.46
 No of Categories: ? 5
 Select Color/Tone Code No : ? 37
 Min value : ? 12000

→ The computer displays the color "menu" together with the maximum, minimum and average of the selected data item.

→ Average min/max values displayed.
 → Input number of categories; color code per category and min/max values per category (reiterated depending upon the number of categories specified).

→ Legend (upper right side of screen) appears after each iteration.

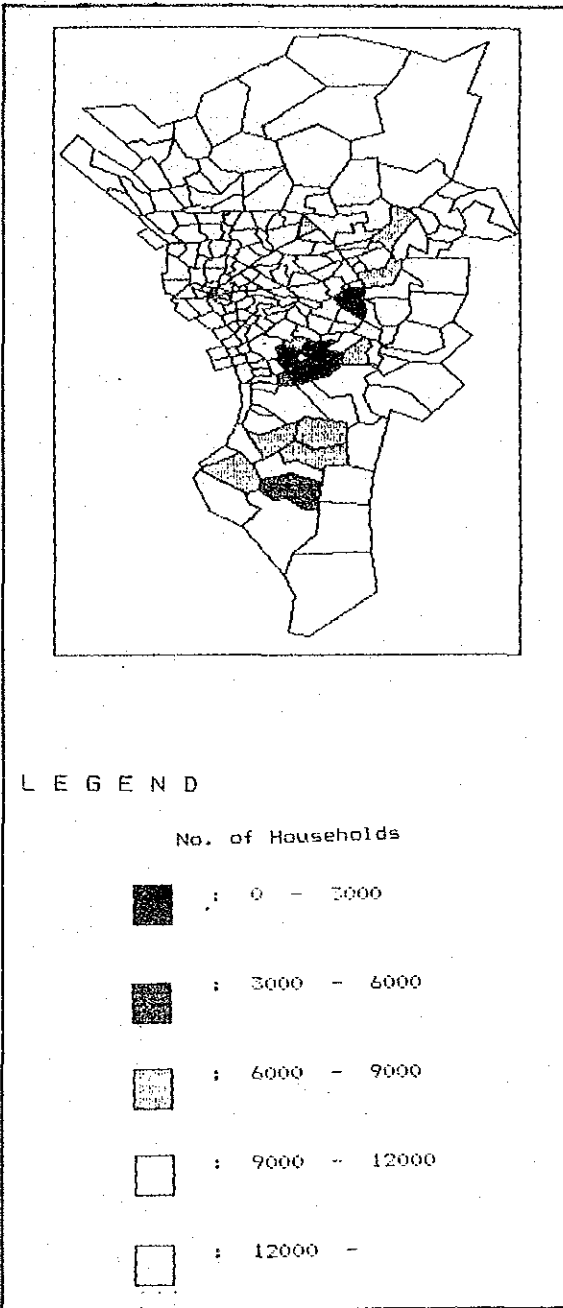
7

File Name of Zone Map? ZONE.DAT
Color Code? 2
File Name of Zone Centroids? NOD202.DAT

(for 202 zones; ZONE24.DAT for 24 zones)

(for 202 zones; NOD24.DAT for 24 zones)

8



Color graphic display of zones according to user-specified indicator (in this case, number of households).

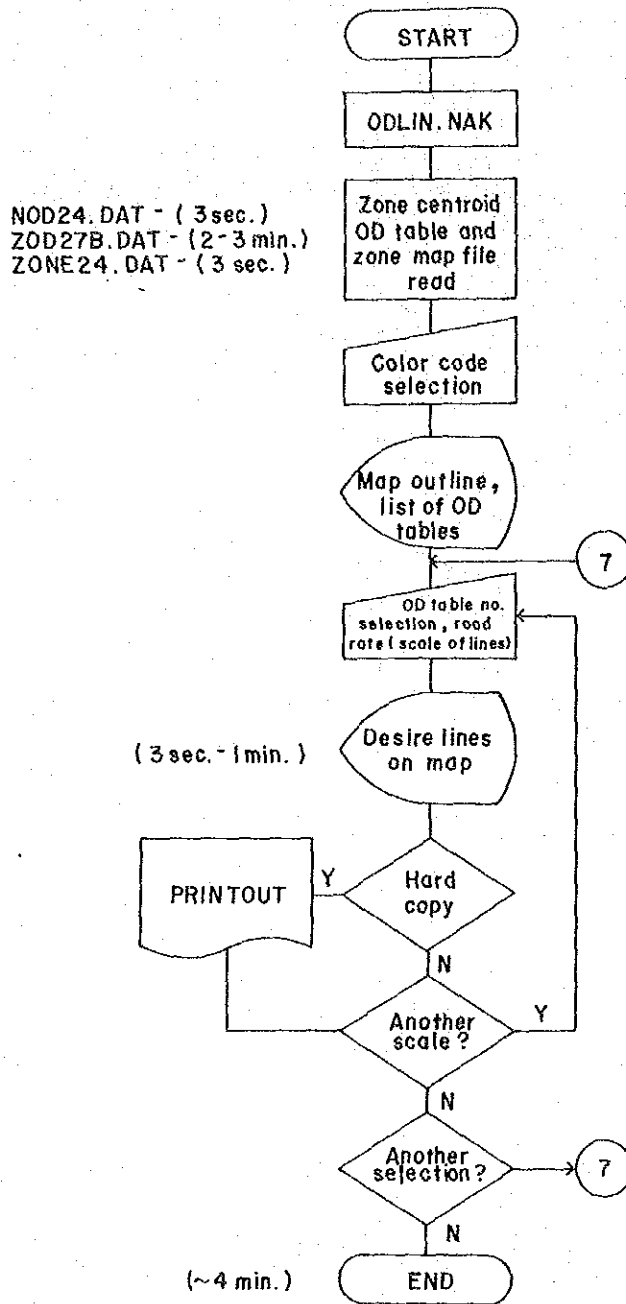
For reiteration of the process, press "return" key.

F. ODLIN.NAK

This program draws desire lines based on the JUMSUT OD tables.

Although applicable only to the 24-zone system, this program may be used for other zoning systems if a set of appropriate data is provided.

Figure 4.9
Flowchart of ODLIN.NAK



Operation of ODLIN.NAK

Remarks

1

Run "ODLIN.NAK" →

Program start: load and run the program

The computer displays a title "Desire Lines". Touch any key to proceed.

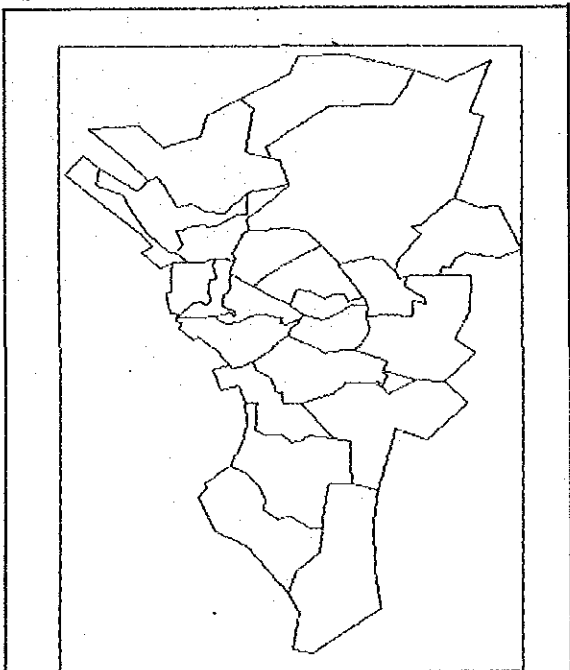
2

File Name of Zone Centroids? NOD24.DAT
File Name of OD Tables? ZOD27B.DAT
File Name of Zone Map? ZONE24.DAT
Color Code? 2 →

Input file names.

Color selection for map outline.

3

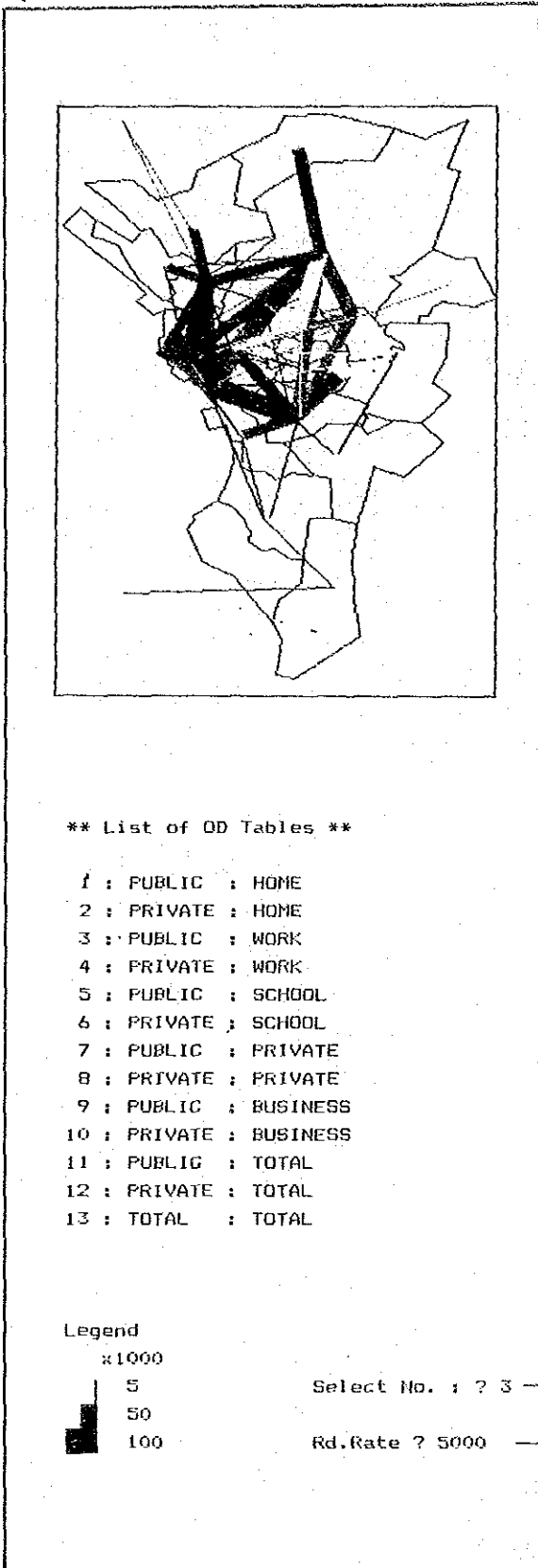


Map outline by zone and OD table menu selection

** List of OD Tables **

- 1 : PUBLIC : HOME
- 2 : PRIVATE : HOME
- 3 : PUBLIC : WORK
- 4 : PRIVATE : WORK
- 5 : PUBLIC : SCHOOL
- 6 : PRIVATE : SCHOOL
- 7 : PUBLIC : PRIVATE
- 8 : PRIVATE : PRIVATE
- 9 : PUBLIC : BUSINESS
- 10 : PRIVATE : BUSINESS
- 11 : PUBLIC : TOTAL Select No. : ? 1
- 12 : PRIVATE : TOTAL
- 13 : TOTAL : TOTAL Rd.Rate ?

4



Desire line display with legend

OD table number selected

This value represents the number of trips represented by one dot on the CRT.

Then the computer draws desire lines on the zone map. If the scale is inappropriate, type "0" to return to "Select No."

(Exercises on the operation of SECODABAS is shown in Appendix 4.1)

4.3.2 JERIMAS

The program files have a complicated structure consisting of function programs and utility programs. Function programs are controlled by a single main program called "PTMNGE.JST", which when run, displays a menu and calls other programs and data files according to the user's specifications.

The five program files controlled by "PTMNGE.JST" are:

- a) DATPRT.JST : Data Printout
- b) DATSRT.JST : Data Sort
- c) DATRET.JST : Data Retrieval
- d) RTINFO.JST : Route Information Display
- e) FREQSC.JST : Frequency Calculation by Road Section

These programs are described in section A, numbers 1 to 5.

The small utility programs independent of "PTMNGE.JST" are enumerated below and described in section B, numbers 6 to 10.

- a) FILCMB.JST : File Combination
- b) FILCNV.JST : File Conversion into "jroute.dat"
- c) PRTASC.JST : Printout of ASCII file
- d) PRTBIN.JST : Printout of "jroute.dat"
- e) XFILE.JST : ASCII file transfer

The data files are as follows:

- a) routel.dat : Jeepney Route Names
 - 1. Mode Number
 - 2. JUMSUT Route Number
 - 3. MOTC Route Code
 - 4. JUMSUT Route Name
- b) route2.dat : Jeepney Route Length, Type and Number of Units by Terminal
 - 1. Mode Number
 - 2. JUMSUT Route Number
 - 3. BOT Code Number
 - 4. Terminal Code
 - 5. Terminal Zone Code
 - 6. Route Length
 - 7. Route Type
 - 8. Number of Units Running
 - 9. Number of Units Operating
 - 10. Number of Units Authorized
- c) route3.dat : Jeepney Route Frequency Data by Time Period
 - 1. Mode Number
 - 2. JUMSUT Route Number
 - 3. Frequency by Hour(6:00 a.m.-10:00 p.m.)

- d) route4.dat : Jeepney Operation Characteristics 1
1. Mode Number
 2. JUMSUT Route Number
 3. Average Travel Speed by Time Period
 4. Average Seating Capacity
 5. Daily Average Travel Time (min.)
 6. Daily Average Terminal Time (min.)
 7. Average Turn-around Time by Time Period (min.)
- e) route5.dat : Jeepney Operation Characteristics 2
1. Mode Number
 2. JUMSUT Route Number
 3. Vehicle-Kilometers
 4. Vehicle-Hours
 5. Average Number of Route Trips/Day/Vehicle
 6. Average Daily Kilometers/Vehicle
 7. Average Load Factor by Time Period
 8. Corridor Numbers Passed
 9. Number of Passengers/Day/Route
 10. Passenger-Kilometers/Day/Route
 11. Average Trip Length
- f) corr.dat : Traffic Volume by Corridor and by Mode
1. Corridor Number
 2. Corridor Name
 3. Section Name
 4. Number of Lanes
 5. Capacity (pcu's/day)
 6. Traffic Volume (car/taxi)
 7. Traffic Volume (van/truck)
 8. Traffic Volume (jeepney)
 9. Traffic Volume (bus)
 10. Traffic Volume (total)
 11. Volume/Capacity Ratio
- g) term.dat : Terminal Data
1. Terminal Code
 2. Terminal Name
 3. No. of Passengers Boarding/Alighting
 4. Terminal Type (Through/Terminating)
 5. Number of Routes
 6. Combined Frequency per Day (16 hours)
 7. Number of Units Operating Daily

The character formats of the above data items are given in Appendix 4.2.

In addition to these primary data, there are three (3) data files that provide a graphic display of the road network and route configuration. They are:

- a) mapxy.dat : (x,y) Coordinates of Points
- b) roadnt.dat : Road Sections defined by Points included in "mapxy.dat"
- c) jroute.dat : Jeepney Routes defined by Road Sections included in "roadnt.dat"

It should be noted, however, that the above three files were developed only to provide a graphic display with no linkage to the JUMSUT data base.

Although the data files mentioned above are the only ones that can be used by this system, there are other data files on the second set of diskettes of this system as follows:

- a) route3.dtl
- b) route3.dt2
- c) route4.dtl
- d) route4.dt2
- e) route5.dtl
- f) route5.dt2
- g) jroute.dtl
- h) jroute.dt2

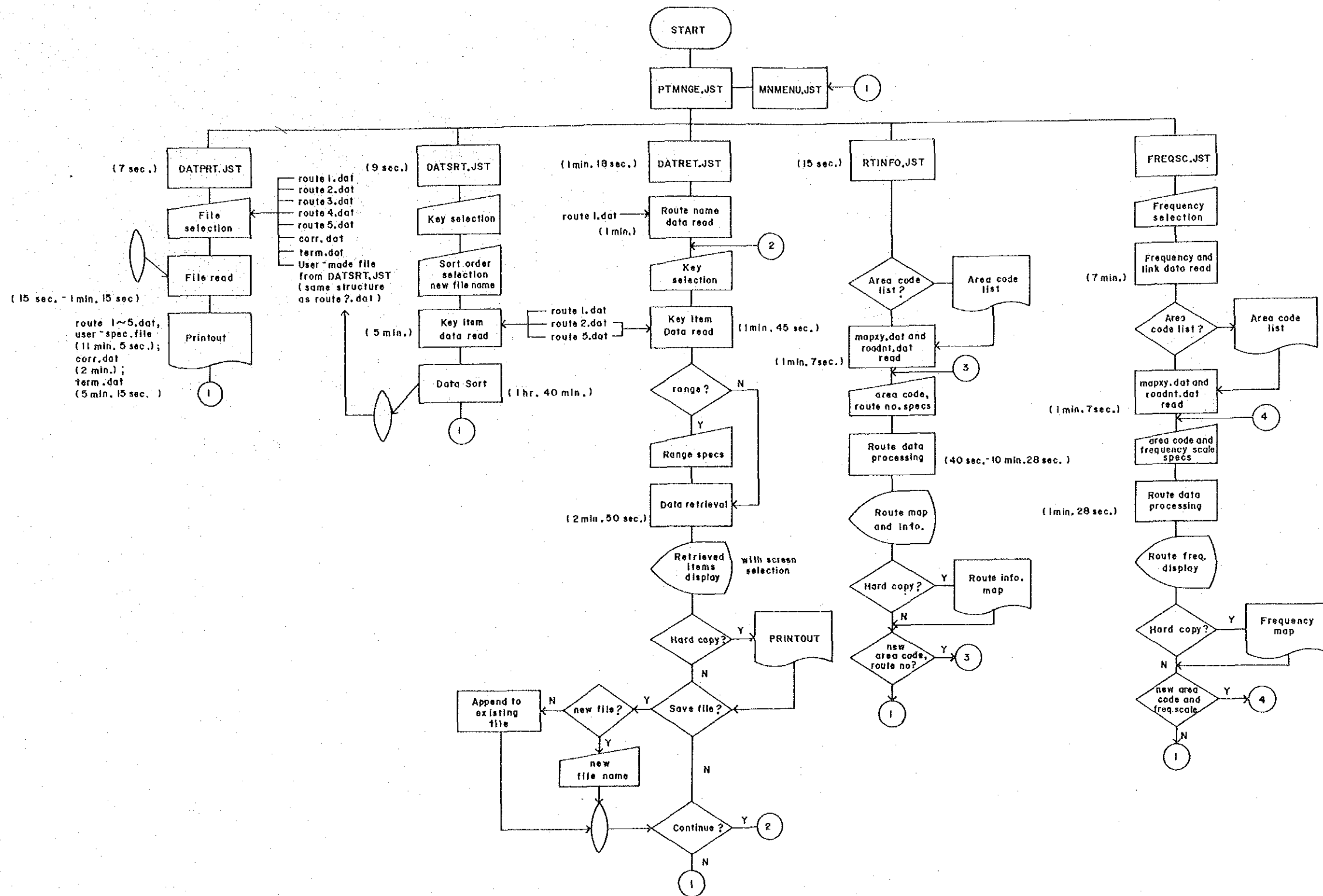
These files are segregated from the original data files in order to facilitate data update; "route3.dat", "route4.dat", "route5.dat", and "jroute.dat" are so large that they cannot be loaded to the main memory all at the same time. After these files have been updated by the screen editor of the operating system, they are converted into the proper data files by the programs which are provided in this system.

The operation of "PTMNGE.JST" and its function programs are illustrated and described using actual sequential screen printouts from the computer. The main program is loaded and run as follows:



After loading, everything else that follows is menu-driven. Unlike in SECODABAS, the function programs in JERIMAS are automatically called (when requested by the user) for convenience. The processing flow of the entire system is illustrated in Figure 4.10.

Figure 4.10
Flowchart of JERIMAS



A. PTMNGE.JST Program Files

1. DATPRT.JST

This program prints out the contents of the following data files with their due formats:

- a) route1.dat
- b) route2.dat
- c) route3.dat
- d) route4.dat
- e) route5.dat
- f) corr.dat
- g) term.dat
- h) other data files created from the "Data Sort" function that have the same structure as "route?.dat" (from (a) to (e) above).

Operation of DATPRT.JST

Remarks

1

What are you going to do ?

1 : Data Printout

2 : Data Sort

3 : Data Retrieval

4 : Route Information Display

5 : Frequency Calculation by Section

0 : Bye

→ Program menu selection display.
Type "1".

2

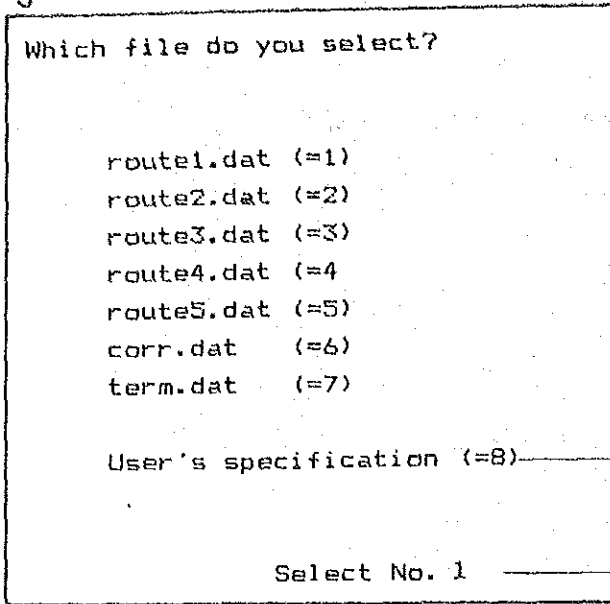
1 : Data Printout _____ →

OK ? (Y or N) _____ →

→ Selected program call prompt

→ OK to call? If not, system goes back to main menu (screen no. 1)

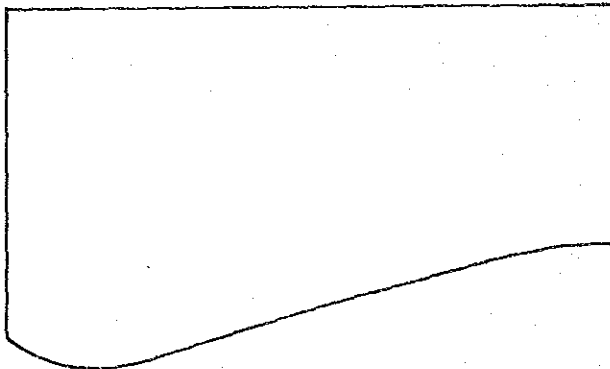
3



Data file menu selection

If selected, user has to input name of created file from data sort/retrieval program (DATSRT.JST/DATRET.JST).

Input data file number



The data file selected is automatically printed out.

The system then automatically returns to the main menu (screen number 1).

2. DATSRT.JST

This program facilitates the rearrangement of jeepney data based on a selected key item, which often becomes necessary in the course of public transport planning and management.

This is applicable only to data files, routel.dat to route5.dat. When running this program, the user has to specify the key data and the sorting orders (ascending/alphabetical or descending/counter-alphabetical).

For example, if "route length" is chosen as the key data and "ascending sort" is selected, the program changes the order of all data files according to route length (from small to large); it then creates new files on the second disk drive. Therefore, prior to the usage of this function, a diskette must be mounted on the second drive. The user can specify the name of the new files to be created using 5 characters. For example, if "rtest" is specified, the following files will be created.

| 1st Drive | 2nd Drive |
|------------|------------|
| routel.dat | rtest1.dat |
| route2.dat | rtest2.dat |
| route3.dat | rtest3.dat |
| route4.dat | rtest4.dat |
| route5.dat | rtest5.dat |

It is to be noted that the created files have the same structure as the original files. Therefore, they can be printed out by the "Data Printout" function of PTMNGE.JST.

This program is the most time-consuming function in this system. The user is requested to be patient even if the computer becomes silent for a long time. One run will take more or less one hour.

Operation of DATSRT.JST

Remarks

1

```
What are you going to do ?

1 : Data Printout
2 : Data Sort
3 : Data Retrieval
4 : Route Information Display
5 : Frequency Calculation by Section
0 : Bye
```

→ Program menu selection display Type "2".

2

```
2 : Data Sort _____
OK ? (Y or N) _____
```

→ Selected program call prompt
→ Only route data files can be sorted
→ OK to call? If not, system goes back to main menu (screen no. 1)

3

```
What are you going to use as a key ?

0 = Mode No.
1 = JUI SUT Route No.
2 = MOTC Route Code
* ** 3 = BOT Route Code
4 = JUMSUT Route Name
* 5 = Terminal Code
* 6 = Terminal Zone Code
7 = Route Length
8 = Route Type
9 = No. of Units Running
10 = No. of Units Operating
11 = No. of Units Authorized
12 = Ave. Travel Speed (Morning)
13 = Ave. Travel Speed (Afternoon)
14 = Ave. Travel Speed (Evening)
15 = Ave. Travel Speed (16 hrs.)

Note : * Plural Code
      ** Coverd Routes Only

Select No. [ Next Screen(=99) or
           First Screen(=100) ] = ? 99
```

→ Key item menu selection display (same as in Data Retrieval Program)

→ Checks against non-item number input.

Note that return key = 0 (mode no.) here. (Since the menu is large, type "99" to proceed, or type "100" to return, before selecting the number).

4

What are you going to use as a key ?

- 16 = Ave. Seating Capacity
- 17 = Frequency(7-8 a.m.)
- 18 = Frequency(2-3 p.m.)
- 19 = Frequency(5-6 p.m.)
- 20 = Frequency(16 hrs.)
- 21 = Ave. Travel Time(16 hrs.)
- 22 = Ave. Terminal Time(16 hrs.)
- 23 = Turn-Around Time(Morning)
- 24 = Turn-Around Time(Afternoon)
- 25 = Turn-Around Time(Evening)
- 26 = Turn-Around Time(16 hrs.)
- 27 = Vehicle-Kms(16 hrs.)
- 28 = Vehicle-Hrs(16 hrs.)
- 29 = Ave. No. of Trips/16hrs./veh.
- 30 = Ave. Kilometerage/16hrs./veh.
- 31 = Load Factor (Morning)

Note : * Plural Code
 ** Coverd Routes Only

Select No. [Next Screen(=99) or
 First Screen(=100)] = ? 99

→ This screen appears if "99" is pressed (continuation of key item menu selection display).

5

What are you going to use as a key ?

- 32 = Load Factor (Afternoon)
- 33 = Load Factor (Evening)
- 34 = Load Factor (16 hrs.)
- * 35 = Corridor Nos.
- 36 = No. of Pass/16hrs.
- 37 = Pass-Kms/16hrs.
- 38 = Ave. Trip Length(16 hrs.)
- 100 = First Screen

Note : * Plural Code
 ** Coverd Routes Only

Select No. [Next Screen(=99) or
 First Screen(=100)] = ? 100

→ More key items.

6

7 = Route Length _____

OK (Y/N) ? _____

→ Key item selected.

→ Item call check.
 (If "N" is typed, the system displays the menu again).

7

```

What order do you choose ?
A : Ascending (Alphabetical )
D : Descending(Counter Alphabetical)
Please type A or D

```

Sort order menu selection

8

```

Sort Method = Ascending
OK (Y/N) ?

```

Selection would change the order of all route data files according to key item selected (in this case, by route length, from small to large).

Sort menu item check (If "N" is typed, the system goes back to the menu above).

9

```

What name do you like to put
to the new file ?
File Name ( 5 characters ) = ? rttss

```

New file name prompt

10

```

File Name ( 5 characters ) = rttss
OK (Y/N) ?

```

New file name input check

11

```

Reading key data file
Sorting started
OK

```

Prompts to inform user of what's currently going on.

After this message, the computer displays on the CRT several messages and the sorted data is saved in the new files. However, the user has no need to take any action, unless an error message is shown on the CRT. Usually, errors are caused by incorrect operation. When an error occurs, the user is requested to type "close" first in order to protect data files opened.

After sorting process, save file is automatic; the new file may be printed out using data printout program. Go back to main menu (screen no. 1) by pressing any key.

3. DATRET.JST

This program screens and collects route data that fall within a specified value/range of a specified key item. This can also be done by "Data Sort". However, the user can obtain or retrieve the necessary data (screened by the value/range specified) more quickly by using DATRET.

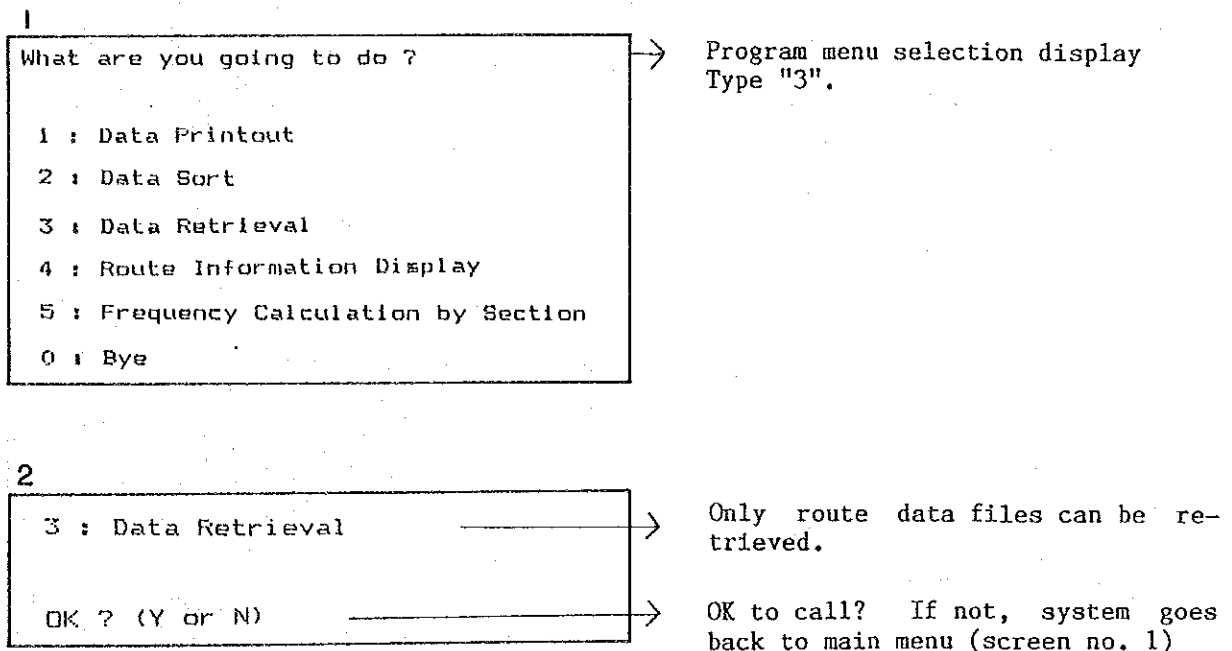
This program provides an option to create a new data file under a name specified by the user. However, the created file cannot be printed out by "Data Printout" since its file structure is different from the original files.

If a hard copy of the retrieved data is needed, there are two ways of doing so:

- a) Press the "COPY" key of the computer keyboard while the necessary information is displayed on the CRT.
- b) Call and run "PRTASC.JST" separately prepared in this system. In this case, the retrieved data must be saved on a diskette beforehand and the printout will not be formatted. Refer to Section B, number 8.

Operation of DATRET.JST

Remarks



3

Reading the route name data now.

Route names read prompt

4

What are you going to use as a key ?

- 0 = Mode No.
- 1 = JULJUT Route No.
- 2 = MOTC Route Code
- * ** 3 = BOT Route Code
- 4 = JUMSUT Route Name
- * 5 = Terminal Code
- * 6 = Terminal Zone Code
- 7 = Route Length
- 8 = Route Type
- 9 = No. of Units Running
- 10 = No. of Units Operating
- 11 = No. of Units Authorized
- 12 = Ave. Travel Speed (Morning)
- 13 = Ave. Travel Speed (Afternoon)
- 14 = Ave. Travel Speed (Evening)
- 15 = Ave. Travel Speed (16 hrs.)

Note : * Plural Code
 ** Coverd Routes Only

Select No. [Next Screen(=99) or
 First Screen(=100)] = ? 95

Key item menu selection display (same as data sort program)

Same functions as in data sort.

5

7 = Route Length

OK (Y/N) ?

Key item selected.

Item call check

6

Reading the key data now. For a while.

Any range to specify?
 (Y/N) = ? Y

from? 7

to ? 10

Data read prompt

Range indicator

If "N" is specified, the computer skips the following process and directly goes to the data display. In this case all the routes will be indicated on the CRT.

If "Y", enter the range. If the specified data are characters, the following message will appear before specifying the range, use the format"&&&&" including blanks.

In this case, user has to specify the range as follows:

from? AAAAA
 to? AZZZZ

After specifying the value/range, the computer will display the retrieved data on the CRT (routes arranged alphabetically). Type "99" or "100" to go forward or backward. If other keys are touched, the computer stops the display. When a hard copy is needed, push "COPY" key.

7

| ** DATA RETRIEVAL ** | | Route Length |
|----------------------|--|--------------|
| 13 | ALMANZA-BACLARAN | 9.7 |
| 23 | ALABANG-BAGUMBAYAN VIA CUPANG | 7.7 |
| 41 | AMPARO-NOVALICHES | 8.4 |
| 50 | BACLARAN-ZAPOTE | 7.8 |
| 74 | BACLARAN-DIVISORIA VIA MABINI, HARRISON | 9.9 |
| 93 | BLUMENTRITT-LIBERTAD VIA QUIAPO, DAKOTA | 9.9 |
| 98 | BLUMENTRITT-VITO CRUZ VIA STA. CRUZ | 8.4 |
| 99 | BLUMENTRITT-VITO CRUZ VIA QUIAPO, TAFT | 8.0 |
| 100 | BLUMENTRITT-VITO CRUZ VIA QUIAPO, MABINI | 8.4 |
| 106 | BACLARAN-P. CAMPA VIA MABINI | 9.9 |
| 107 | BACLARAN-P. CAMPA VIA DAKOTA | 9.8 |
| 162 | BAGBAGUIN-MALINTA | 7.5 |
| 176 | BICUTAN-SUCAT | 9.8 |
| 180 | BICUTAN-PASAY RTDA. | 9.9 |
| 188 | BBB/TULLAHAN-BLUMENTRITT | 8.2 |

Next Screen (=99) or First Screen (=100) = ? 99

8

```

Do you want to save these data (y/n)=? y
New File (=1) or
Append the file (=2) = ? 2
File name = ? 2:tesort.dat
Continue (Y/N) = ? N
  
```

Option to save retrieved data.

If "N" is typed, the computer proceeds to ask "continue (Y/N)?" as explained below.

If "2" is specified, the data will be added to an existing file. This option will be used for accumulating the data retrieved.

Then the computer saves the data.

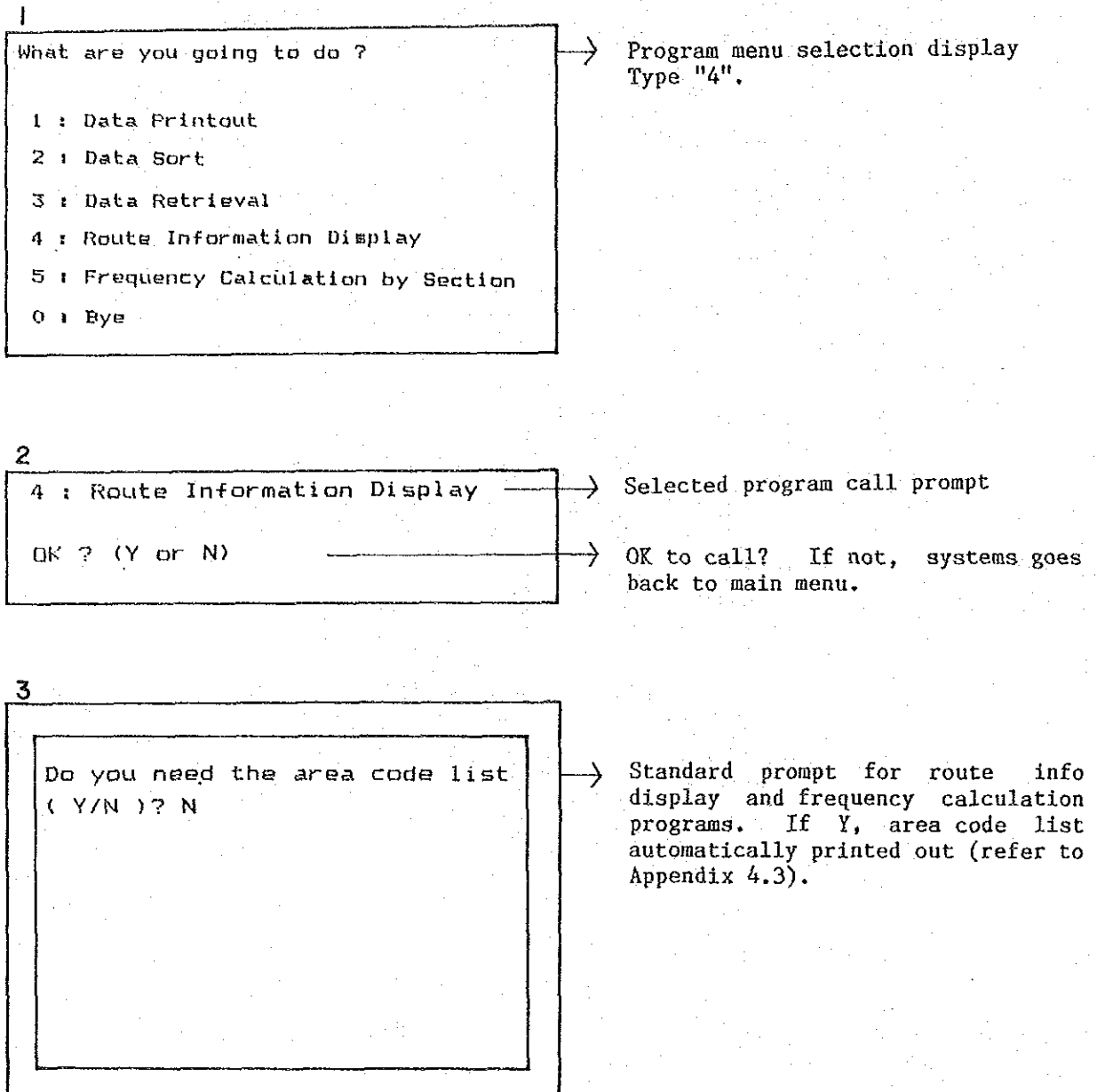
The computer goes back to the main menu. If "Y" is specified, the menu for selecting key data is displayed again.

4. RTINFO.JST

This program has been developed so that the user may easily understand the characteristics of a specified route. It displays in graphics and summarizes information of a specified route on the Metro Manila road network.

Operation of RTINFO.JST

Remarks



4

```

mapxy.dat
reading
>>>>>>

roadnt.dat
reading
>>>>>>>>>>

Area Code (1-32)? 3
Route No.? = 2
  
```

Reading graphic data to display road network.

Input area code number

Choose from 1 to 744. (User must have ready list of Manila routes according to route code).

5

```

Route Information
JUMSUT No. 1
Name:ALABANG-PASAY RTDA
MOTC Code
BOT Code

Terminal MT 1 PC 9
Zone 195 59
Length 16.1(km)
T.Arnd. Time 114 min
Travel Speed 18.6 kph
Trip Length 6.4 km
Load Factor 48 %
Units Runng 155
Frequency 695 16h
Passengers 26771 16h
Pass-kms 170941 16h
Vehicle-kms 22376 16h
Vehicle-hrs 1322 16h

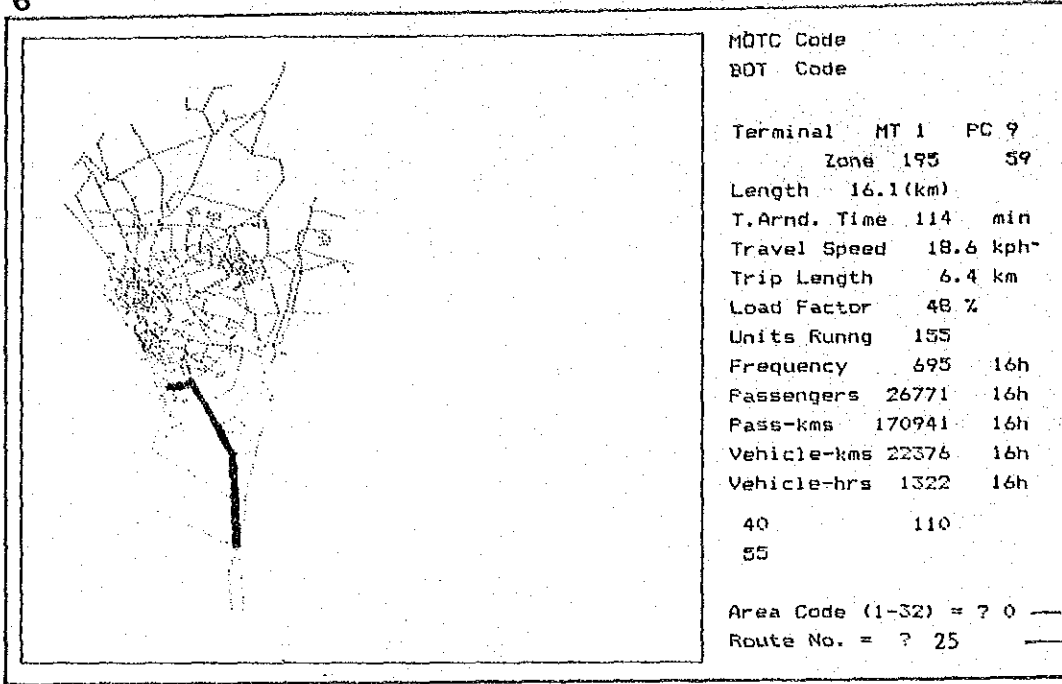
Area Code (1-32)? 1
Route No.= ? 2
  
```

Route info display

Option to change area code provided

Also, route number

6



MDTC Code
BOT Code

| | | |
|--------------|----------|------|
| Terminal | MT 1 | PC 9 |
| Zone | 195 | 59 |
| Length | 16.1(km) | |
| T.Arnd. Time | 114 | min |
| Travel Speed | 18.6 | kph |
| Trip Length | 6.4 km | |
| Load Factor | 48 % | |
| Units Runng | 155 | |
| Frequency | 695 | 16h |
| Passengers | 26771 | 16h |
| Pass-kms | 170941 | 16h |
| Vehicle-kms | 22376 | 16h |
| Vehicle-hrs | 1322 | 16h |
| 40 | 110 | |
| 55 | | |

Area Code (1-32) = ? 0 →
Route No. = ? 25 →

Area code
∅ implies
change of
route no.

5. FREQSC.JST

This program displays in graphics the jeepney traffic flow along a specified area of the Metro Manila road network. The scale of the display can be changed in the same manner as the "Route Information Display" function; and the hour of the day can be varied between 6:00 a.m. and 10:00 p.m. accordingly.

This program is also useful for identifying route coverage.

Program Operation

Remarks

1

What are you going to do ?

- 1 : Data Printout
- 2 : Data Sort
- 3 : Data Retrieval
- 4 : Route Information Display
- 5 : Frequency Calculation by Section
- 0 : Bye

→ Program menu selection display
Type "5"

2

5 : Frequency Calculation by Section

OK ? (Y or N)

→ Selected program call prompt

→ Program call check

3

Which data do you choose?

- 0 = Frequency Morning Peak (7- 8 a.m.)
- 1 = Frequency Afternoon off Peak (2- 3 p.m.)
- 2 = Frequency Evening Peak (5- 6 p.m.)
- 3 = Frequency (16 hours)
- 4 = Frequency Morning (6- 9 a.m.)
- 5 = Frequency Afternoon (1- 4 p.m.)
- 6 = Frequency Evening (5- 8 p.m.)
- 7 = Frequency (6- 7 a.m.)
- 8 = Frequency (8- 9 a.m.)
- 9 = Frequency (9-10 a.m.)
- 10 = Frequency (10-11 a.m.)
- 11 = Frequency (11-12 a.m.)
- 12 = Frequency (12- 1 p.m.)
- 13 = Frequency (1- 2 p.m.)
- 14 = Frequency (3- 4 p.m.)
- 15 = Frequency (4- 5 p.m.)

Note : One-way frequency

Select No. [Next Screen(=99) or

First Screen(=100)] = ? 99

→ Key item menu selection display

→ Same function as data sort and data retrieval program prompts.

4

Which data do you choose?

16 = Frequency (6- 7 p.m.)
 17 = Frequency (7- 8 p.m.)
 18 = Frequency (8- 9 p.m.)
 19 = Frequency (9-10 p.m.)
 00 = First Screen

Note : One-way frequency

Select No. [Next Screen(=99) or
 First Screen(=100)] = ?

This screen appears if "99" is pressed (continuation of item menu selection display).

5

7 = Frequency (6- 7 a.m.)

OK (Y/N) ?

Item call check

6

reading frequency data

reading link data by route

System prompts about what's happening

(The computer reads the necessary data stored on the diskette. After a while, the computer sets a frame on the CRT for graphic display).

7

Do you need the area code list?
 (Y or N) Y

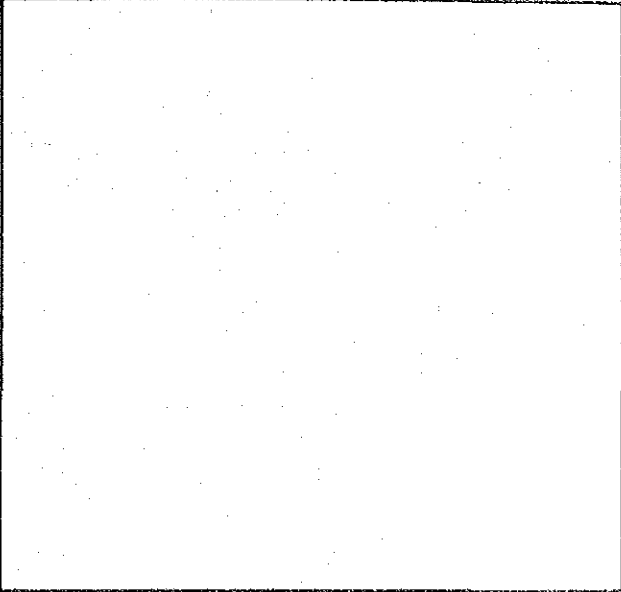
Same as route info display

1 METRO MANILA
 2 NORTHERN METRO MANILA
 3 INSIDE EDSA
 4 EASTERN METRO MANILA
 5 SOUTHERN METRO MANILA
 6 MALABON/NAVOTAS
 7 VALENZUELA

Auto printout of area code list.

30 AYALA
 31 LIBERTAD
 32 BACLARAN/PASAY RTDA.
 33 USER'S SPECIFICATION

8



```

mapny.dat
reading
>>>>>>

roadnt.dat
reading
>>>>>>>>>>
Area Code (1-32)? 3

Inside EDSA
  frqmax = 1920
  r =? 500
  
```

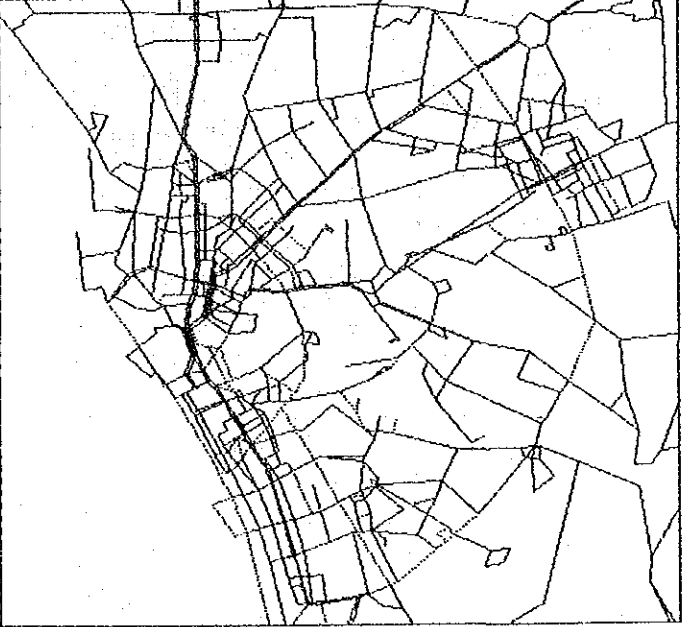
Same process as route info display.

Input area code selected.

Maximum frequency value

Indicates number of frequency per dot of the CRT.

9



```

Frequency ( 6- 7 a.m.
Inside EDSA

LEGEND
  Max

Area Code (1-32)? 3

Inside EDSA
  frqmax = 1920
  r =? 500

Maximum frequency      1920
Rate of reduction      100
No. of dots (max.)    19
  
```

Then the computer displays the flow diagram of jeepney traffic on the CRT with a legend.

Another area code? Else, type "0" to go back to main menu. (This appears only after frequency map display has been completed).

Press "COPY" key for hard copy

(Exercises on the operation of JERIMAS are shown in Appendix 4.4).

B. Independent Program Files

6. FILCMB.JST

This program combines several data files into one.

After updating segregated data files on the second dis-
kette, using the screen editor, this program is run to
create an aggregated data file which can be used by
"PTMNGE.JST".

Program operation is as follows:

| CRT Display | Input by User (Example) |
|---------------------------------------|-------------------------|
| | RUN "FILCMB.JST" |
| How many files are to be combined? | 2 |
| Input File Name 1? | 2: route5.dtl |
| Input File Name 2? | 2: route5.dt2 |
| Output File Name =? | route5.dat |
| For a while, please. Completed. | |

7. FILCNV.JST

This program works in a similar manner as "FILCMB.JST".
However, this is applicable only when updating "jroute.
dat" which is a random access file; while "FILCMB.JST" is
used to update sequential data files, which includes
"route3.dat" to "route5. dat".

This is operated as shown below:

| CRT Display | Input by User (Example) |
|---|--|
| | RUN "FILCNV.JST" |
| File name (input) =? | 2: jroute.dtl |
| File name (input) =? | 2: jroute.dt2 |
| | (These two files must be updated beforehand by the screen editor.) |
| File name (output) =? | jroute.dat |
| | (Then the computer starts data processing with indications of the progress on the CRT.) |
| Do you want to test the data? (Y/N) =? | Y |
| | (When "N" is typed, operation will be finished at once.) |
| When you stop testing, type "0". | |
| Route No.? | 400 |
| | (Then the computer indicates the processed data on the CRT.) |
| Route No.? | 744 |
| Route No.? | 631 |
| Route No.? | 0 |
| | (When "0" is typed, operation ends.) |

8. PRTASC.JST

This program produces a printout of any file saved on a diskette in ASCII code. Formatting of the printout is not taken into account.

Program operation is as follows:

| CRT Display | Input by User (Example) |
|---|-------------------------|
| | RUN "PRTASC.JST" |
| Input file name =? | mapxy.dat |
| (Then the computer produces a printout of "mapxy.dat".) | |

9. PRTBIN.JST

This produces a printout of the random access file, "jroute.dat". This is not applicable to other files.

Program operation is as follows:

| CRT Display | Input by User (Example) |
|--|-------------------------|
| | RUN "PRTBIN.JST" |
| (Then the computer produces a printout of "jroute.dat" automatically from route nos. 1 to 744. If the number of routes is changed, this program must be modified (program line 1040).) | |

10. XFILE.JST

Although a file transfer program called "xfile.n88" is provided in the NEC system, it transfers all the files from one diskette to another. "XFILE.JST", on the other hand, transfers a specified file from one diskette to another.

This program is applicable to ASCII files.

Program operation is as follows:

| CRT Display | Input by User (Example) |
|---|-------------------------|
| | RUN "XFILE.JST" |
| Input file name =? | roadnt.dat |
| Output file name =? | 2: ptnt.dat |
| (Then the computer transfers "roadnt.dat" on the first diskette to the second diskette under the name of "ptnt.dat".) | |